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GEORGIA FOREST LOOKOUT

Volume 1

ATLANTA, GA. JANUARY, 1931

Number 1

INTRODUCING GEORGIA FOREST LOOKOUT

This is Number One, Volume One, of the Georgia Forest Lookout, a monthly publication issued by the Georgia Forest Service. The object of the publication is to stimulate interest in forestry in Georgia.

The need of such a publication has been felt for some time. Through this medium it is hoped that a closer touch and more helpful relationship may be maintained among those working to upbuild the forest resources of the state.

The information contained is intended to be instructive and encouraging. It is our desire to make it an organ of forestry activities among progressive timber owners of the state. To make it all it should be as a kind of "forestry clearing house" calls for cooperation. Will not the readers send in items of interest as often as they can?

The Georgia Forest Lookout will go to every member of the Timber Protective Organizations of the state and items of interest from these organizations will always be welcome.

The rural schools having vocational agriculture teachers and school forests will find the columns open to contribution concerning interesting activities in regard to forestry in the schools.

Activities of the Georgia Forestry Association will be reported, and the various activities of the Georgia Forest Service will be reviewed; a digest of useful information from various sources will be presented.

The publication is small. Boil down your contributions so that a great deal of interesting matter may be compressed in the small space. Any suggestions for improvements of the publication will always be welcome.

B. M. LUFBURROW,
State Forester.

Stop Woods Fires, Grow
Timber—It Pays

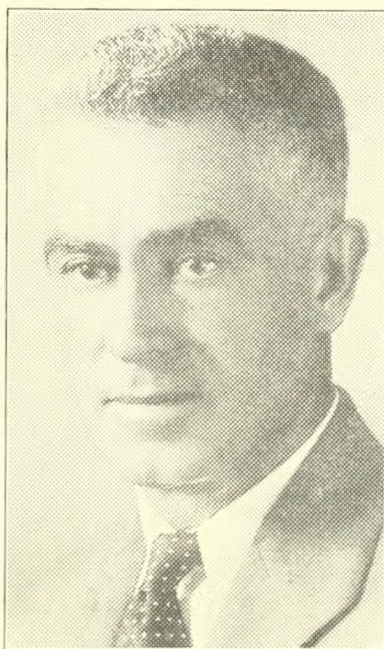
SCHOOL PROJECT IN FORESTRY

Georgia First State to Inaugurate School
Forest in Agricultural Vocational
Schools

The second year in conducting the forestry project with vocational agriculture schools of Georgia is proceeding in an encouraging manner. With hardly an exception each white vocational school in the state has a school forest where the practice of forestry management is demonstrated by representatives of the Georgia Forest Service two or three times each scholastic year. Complete management plans for each forest is made and specific work for the students to do under the direction of the agriculture teacher is carried out.

Colored vocational teachers have begun to take a more general interest in the project this year.

(Continued on page 2, column 3)



C. L. VEATCH, COMMERCE, GA., WINNER
TEACHERS' PRIZE, 1930

GEORGIA FORESTRY ASSOCIATION DRIVE

Organization's Development Plan Calls for
Increase in Membership, Educational
Activity, and Promotion of State's For-
est Interests Along Many Lines.

The Georgia Forestry Association is the father of the Georgia Forest Service, and has been the guiding influence in developing broad policies and legislation pertaining to the state's forest resources. Its leaders are prominent business and professional men and public spirited women who have given their time and thought without compensation to developing this great natural resource of the state.

Admitted to be the most active and enthusiastic member of the Association from its inception is Hon. Bonnell Stone, of Blairsville, a professional forester. On account of his achievements he has been dubbed the "Father of Forestry in Georgia".

The president of the association is Mr. T. G. Woolford, Atlanta, a leading business man and president of the Atlanta Retail Credit Company. The vice-president is Mrs. M. E. Judd, Dalton, landscape architect and prominent in women's club work. Hon. S. H. Morgan, Guyton, attorney, is second vice-president; Dr. W. M. Folks, physician, Waycross, third vice-president; J. A. McCord, prominent business man of Atlanta, is treasurer, and Bonnell Stone, Blairsville, secretary. C. B. Harman, Atlanta, is chairman of the Executive Committee.

Among others who have been active in the Association are Hon. W. T. Anderson, Editor, Macon Telegraph; the late James Holloman of the Atlanta Constitution; D. G. Bickers, Savannah News; Miss Emily Woodward, Vienna, former president of the State Press Association; Gordon Reynolds, Albany; Hon. Leonard Rountree, Summit; James Fowler, Soperton; James B. Nevin, Atlanta Georgian; Captain I. F.

(Continued on page 2, column 1)

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Published Monthly By
GEORGIA FOREST SERVICE
 State Capitol Atlanta, Ga.
 C. A. Whittle, Editor

Staff of the Georgia Forest Service

B. M. Lufburrow, State Forester.....Atlanta
 C. A. Whittle, Director of Education and Utilization Atlanta
 Everett B. Stone, Jr., Assistant State Forester Gainesville
 Harold M. Sebring, Assistant State Forester Albany
 C. Bernard Beale, District Forester Waycross
 W. D. Young, District Forester.....Rome
 Jack Thurmond, District Forester.....Swainsboro
 Charles N. Elliott, Assistant Director of Education Atlanta
 Mrs. Nellie Nix Edwards, Secretary to the State Forester Atlanta
 Miss Clifford Sims, Secretary to the Director of Education and Utilization, Atlanta

Forest and Waters

The most recent bulletin issued by the Georgia Forest Service is entitled "Forest and Waters", prepared by Director of Education C. A. Whittle.

The bulletin tells how unburned forest floors conserve rainfall so as to reduce flood damage and increase the constant flow of springs and streams, thereby increasing water power; how unburned forest floors increase the rate of tree growth by providing more water for the use of the trees; how lakes, streams and reservoirs are protected from deposits of silt and sand; and how erosion damage is reduced.

The bulletin will be sent free on request.



MORE RESEARCH FAVORED BY FORESTRY BOARD

At a meeting of the Georgia State Board of Forestry held recently a resolution endorsing the forest research work inaugurated in the mountains of north Georgia near Blairsville in which the Appalachian Forest Experiment Station of the federal government, the Georgia Experiment Station and the Georgia Forest Service are cooperating, was passed and the board urged that the work be extended to the Piedmont region.

The board also asked that the Southern Forest Experiment Station establish a branch station in Georgia for research work in the pine belt.



GEORGIA FORESTRY ASSOCIATION DRIVE

(Continued from page 1, column 3)

Eldredge, Fargo; Col. R. E. Benedict, Brunswick; Eitel Bauer, Callaway Estate, LaGrange; B. C. Milner, State Highway Department, Atlanta; H. L. Kayton, Savannah; United States Senator Wm. J. Harris; Judge Ogden Persons, Forsyth; H. P.

Stuckey, director of Georgia Experiment Station, Griffin; J. M. Mallory, Central of Georgia Railroad, Savannah; Edgar S. Center, Atlanta and West Point and Georgia railroads, Atlanta; Roland Turner, Southern Railway, Atlanta; DuPree Barrett, School of Forestry, Athens; Mrs. E. G. Townsend, St. Mary; Mrs. Nora L. Smith, Ashburn.

Among the achievements of the Georgia Forestry Association is the creation of public sentiment that resulted in establishing the organized forestry work of the state, headed by B. M. Lufburrow as state forester and directed by the Georgia State Board of Forestry consisting of Governor L. G. Hardman, chairman; George H. Carswell, secretary of state; S. W. McCallie, state geologist; Hon. Leonard Rountree, Summit; Alex Sessoms, Cogdell; Mrs. M. E. Judd, Dalton; C. B. Harman, Atlanta; Bonnell Stone, Blairsville, and J. Phil Campbell, Athens.

In May, 1930, the Association, assisted by the United States Chamber of Commerce and the Savannah Chamber of Commerce, held the Georgia Commercial Forestry Conference at Savannah. The addresses at this conference, which were put in print, are said to be the most important contributions ever made to the solution of forestry problems of the state.

Studies have been made by the Association of various legislation that affect the development of forestry in Georgia, and safe and sane advice on matters of this sort can always be expected from this source.

The Association has sponsored educational projects in the state. By the offer of prizes the teachers of vocational agriculture are encouraged to carry out their forestry projects. Assistance is being offered to establish a summer forestry camp for vocational high school boys interested in forestry. Plans are on foot for carrying

an educational campaign in forestry to rural consolidated schools in the state.

Why not join the Association and have a part in the great undertaking headed by the Georgia Forestry Association?



MEMORIAL TOWER FOR FOREST UNIT

The steel forest tower erected on the Timber Protective Organization area at Warm Springs is a memorial tower erected by Miss Georgia Wilkins, Columbus, Georgia, who in this way memorialized her uncle, Charles Davis, for many years a leading citizen of Meriwether county and a former owner of the Warm Springs property.

The tower was dedicated on December 8 by Governor Franklin D. Roosevelt, who at that time was spending a vacation at his Georgia home.



SCHOOL PROJECT IN FORESTRY

(Continued from page 1, column 1)

The work this year is being taken up with continued enthusiasm by teachers and pupils. The subjects being taught and demonstrated on the school forests are tree identification, tree planting, thinning, estimating the volume of standing timber, fire protection and uses of Georgia woods.

The Georgia Forestry Association is lending encouragement to this work by offering \$100 to the white teacher and \$50 to the colored teacher doing the best work on the forestry project.

The winner of the first year was C. L. Veatch, vocational teacher at Commerce. No prize was offered the first year to colored teachers. Mr. Veatch had his students collect tree seed, plant 4 seed beds, plant 4,000 loblolly pines, 150 black locusts, and 150 red cedars.

The management plans of the school forest were carefully followed. Signs were placed on roads and at the forest calling attention to the school forest. Six of his students took up home forestry projects. Interest was created by Mr. Veatch in tree planting in the community and as a result several thousand pines were planted on abandoned fields. Assistance was rendered the Georgia Forest Service in establishing a roadside demonstration forest which Mr. Veatch and his students are to maintain.

A number of teachers did high character work last year, among them being F. B. White, Barnesville; Wm. B. Bates, Stockton; Clovis Turk, Sale City; W. F. Fletcher, Cochran; Leroy C. Lanford, Leslie; T. L. Everett, Waresboro; P. L. Elkins, Cumming; Geo. I. Martin, Sylvester; Carl Seagraves, Red Hill; C. M. Reid, Sardis; J. K. Callahan, Wrens; Jeff Davis, Pavo; C. H. Brand, Rock Branch; Gordon Nesmith, Omega.



BONNELL STONE, BLAIRSVILLE, GA.,
 "FATHER OF FORESTRY IN GEORGIA"

GEORGIA SYSTEM FIRE PROTECTION

Timber Protective Organizations Grow in Popularity—Fire Loss Low— Refund on Part of Cost.

The Georgia Forest Service has developed a system of organized fire protection that is distinctive in nature. Since its inception it has found favor in other states. The system briefly stated consists in the cooperation of timberland owners in forming timber protective organizations, these organizations taking over the responsibility for forest fire control.

Plans for fire protection, suggested by the Georgia Forest Service are carried out by members of the timber protective organizations. In general these plans call for fire break construction, lookout towers, telephone lines and fire fighting equipment. In every unit a number of men are subject to call in suppressing fires.

Once a year the cooperating timber owners make out their bills of cost in carrying out the fire protection plans and after these accounts have been approved, one third of the cost is refunded by the Georgia Forest Funds with funds obtained from the federal government by virtue of the Clark-McNary Act. The annual cost per acre averages about 4 cents per acre.

At present there are 32 of these timber protective organizations in the state aggregating 1,275,000 acres of protected timber. The minimum area allowed for a timber protective organization is 10,000 acres. No limit is set on the maximum acreage. The largest single unit is about 200,000 acres. It is the policy to extend the smaller units into larger ones and to consolidate different units into still larger ones. This helps to reduce the overhead cost.

The timber protective organizations have been very effective. In 1929 less than one percent of the protected area was burned over, whereas in surrounding territory about 22 percent of the land was burned over. While the figures for 1930 are not complete the reports for the three quarters indicate a record equally as good as 1929 on an increased acreage.

Most of the timber protective organizations thus far have been organized in South Georgia. Some large units, however, are located in the mountain areas. In regions of small landowners it is, of course, more difficult to form cooperative organizations. In unorganized regions, efforts are directed largely to educational work through publicity, school contacts, school demonstration forests and roadside demonstrations.

The Georgia Forest Service is anxious to extend the area protected under the Timber Protective Organization plan, believing that nothing will give so good results. Any community desiring to organ-

ize may call on the Georgia Forest Service for assistance.

ROADSIDE FOREST DEMONSTRATIONS

At twenty-five points by the sides of leading highways of the state are what are termed "roadside demonstration forests". Public attention is directed to the forests with blue and yellow metal signs 4 by 6 feet in dimensions. The wording on the signs calls attention to natural reproduction of forests where fires are kept out. The name of the local cooperating agency, probably a civic club, and the name of the Georgia Forest Service appear at the bottom.

Other roadside demonstration forests will be established. The demonstration idea goes beyond a lesson in fire prevention. These forests are also to be used for thinning demonstrations to show how fast trees may be made to grow.

Chatham County Makes Drive for Forestry

Chatham county, in which Savannah is located, is putting on a drive to form Timber Protective Organizations. The Chamber of Commerce of Savannah is sponsoring the movement. State Forester B. M. Lufburrow addressed business men in Savannah in November when the movement was definitely launched. H. M. Sebring, assistant state forester, and Jack Thurmond, district forester, are rendering assistance.

A forest resource survey of an area 75 miles in diameter around Savannah is being completed. Savannah, as a great naval stores and lumber center, hopes to become a center of paper manufacture as well. Savannahans are intensely interested and enthusiastic over the timber prospects of southeastern Georgia.

SHORTLEAF PINE MAKES RAPID GROWTH

C. L. Veatch, teacher of vocational forestry at Commerce, reports one year's growth of shortleaf pine after thinning in the school forest to average 5-8 inch in diameter for 80 pine trees.

This increment of growth, Mr. Veatch estimates, is worth more at present prices of lumber and cordwood than the yield of cotton on the same land would have been worth.

Since the year was comparatively dry, the growth record is regarded as exceptionally good.

Mrs. Edwards Honored

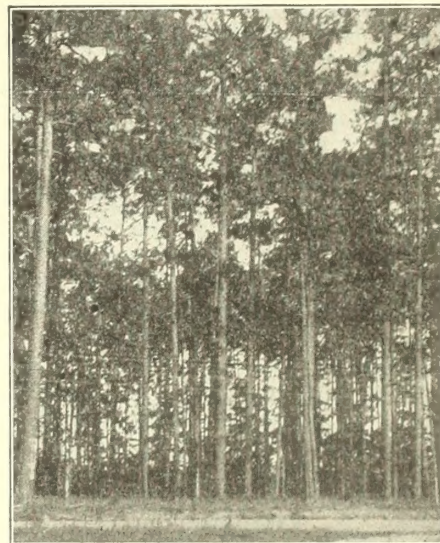
Mrs. Nellie Nix Edwards, secretary to State Forester B. M. Lufburrow, was recently elected President of the Woman's Division of the Atlanta Chamber of Commerce for the year 1931.

SOUTHERN PINES FOR PAPER MANUFACTURE

Southern Pine Suitable for Producing White Paper—Epochal Discovery of Dr. Charles H. Herty—Great Possibilities in Store.

Second growth pine before it begins to form an appreciable amount of heartwood is as free of gum as red spruce and as good for the manufacture of white news print and book paper. This discovery is to be credited to Dr. Charles H. Herty, noted New York chemist and a native of Georgia.

Until Dr. Herty instituted research leading to the discovery that southern pines up to 25 or 30 years of age contained very little gum, it was generally supposed that the trees were heavily charged with gum because when chipped they produced large quantities of it. But a chemical analysis showed second-growth pine contained very little gum and that the gum-forming cells are inactive until the tree is wounded or until it is old enough to begin forming heartwood.



GEORGIA HAS MILLIONS OF ACRES OF PINE
SUITED FOR PAPER MANUFACTURE

The question then arose "why not southern pine for white paper?" It had been used for a long time to make brown paper. There seemed to be no good reason why southern pine would not make white paper treated in the same way red spruce is treated. To determine that point, trial shipments of southern pine were made to a paper manufacturing plant in the north. The slash pine was used in this test. It was treated as red spruce and made a whiter and stronger paper than the spruce.

There seems to be no reason why the



second-growth pines are not as well adapted to the manufacture of white paper as the slash pine; therefore, it seems that the whole south is full of timber on which the paper industry can draw in the future for its pulp for white paper. Since the red spruce has been cut out and will require 60 to 75 years to grow another crop, and since the south has its abundant rapid growing pines ready to produce wood of 4-inch diameter every 8 or 10 years, it has seemed that the paper mills of the north would follow the textile mills and come south where the wood fiber supply is large and can be made continuously large. Such a movement is apparently inevitable.

With this new demand in prospect, what are southern land owners going to do about it? Would it not be wise to keep out the forest fires and give the young trees a chance to start growth? Would it not be wise to keep out fires so that the larger trees may have a chance to make rapid growth? Would it not be wise to thin the forests and use good judgment in growing crops of trees as one does cotton and corn?

When the south is called upon to provide wood pulp for paper, it will be wise to sell thinnings and tops of sawed timber for wood pulp and keep on growing trees to saw log size, for that is the economic way of growing timber for the needs of tomorrow.



BRANTLEY COUNTY T. P. O. PUTS UP POSTERS

The newly formed Brantley County Timber Protective Organization ordered, as one of its first acts, posters for putting up on the protected land. The wording of the posters is good and is reproduced herewith.

One poster is as follows:

Lands Being Reforested
Be Careful With

FIRES

**Brantley County Timber Protective
Organization**
in cooperation with

Georgia Forest Service

The other poster contains the following words:

POSTED

against

FIRE

**This Land is Under State Cooperative
Fire Control.**

Please Help Us Keep Fires Out.



SCREVEN COUNTY MEANS TO PROTECT FORESTS

Screven county comes to the front with an aggressive campaign of forest fire protection. The Kiwanis Club of Sylvania is sponsoring a movement to protect the for-

ests and has called upon the Georgia Forest Service for fire posters. These they have posted over the county.

The county commissioners also have taken an aggressive stand. The clerk has called for posters and literature and writes that officers of the county have instructions to prosecute every person who violates the law against burning off forests.

Screven county sets an example which many other Georgia counties might well follow.



TREE SEEDLINGS AT STATE NURSERY

Those who contemplate planting pines this winter or in the early spring should place their orders with the state tree nursery without delay. Slash, longleaf and loblolly pines are being offered at from \$2.50 to \$3.00 per thousand. The Georgia Forest Service cooperates with the School of Forestry at Athens in operating the tree nursery. This year a large number of excellent one-year-old trees are available. They are better for planting than seedlings taken from the forest.

Do you not have some old fields that are not being reforested naturally or with proper species? Then you should plant pines and the sooner the better. Place your order for future shipments. Do it now.



Georgia Industrial College Seniors Organize Forestry Club

The boys in the Senior Vocational Agriculture class at the Georgia Industrial College, Barnesville, have recently organized a forestry club. This organization grew out of the forestry projects being carried on in vocational agricultural schools by the Georgia Forest Service and has for its purpose the study of forestry and related subjects.

Members of the club are planning to erect a log house in the demonstration forest where they will hold their meetings. Other interesting projects in forestry are being planned by the club.



Appropriation for Naval Stores Research

Congressman W. C. Lankford of Georgia has introduced a bill in Congress asking for an appropriation of \$30,000 with which to carry on field laboratory research in naval stores production. This bill has been approved by the agricultural committee and is included in the general agricultural bill.

The agricultural committee has also approved an appropriation for \$62,300 for carrying on the established research work in naval stores now in progress.

GEORGIA LEADS IN FOREST AREA



**Federal Report Puts Georgia Forest
and Potential Forest Land at 23,-
100,000 Acres—Southern States
Have More Than Half Nation's
Forest Area.**



Of all states in the Union, Georgia has the greatest reason to be "forest minded", for this state has more acres in forest and potential forest land than any other state. According to the report of the United States Forest Service, Georgia has 23,100,000 acres in trees and undergoing reforestation. This means that Georgia has great opportunities and responsibilities in growing the future timber supply.

The report shows that other southern states are in the forefront in timber area, making it certain that the nation must look to the south for its future supply of timber. Next to Georgia in timber area is Florida with 22,900,000 acres, with Alabama close behind with 22,386,000 acres. Other southern states in their order are Arkansas, 22,000,000; North Carolina, 20,568,000; Mississippi, 19,500,000; Louisiana, 17,000,000; Texas, 15,657,000; Virginia, 14,005,000; Oklahoma, 12,388,000; South Carolina, 12,500,000; Tennessee, 10,430,000; and Kentucky, 9,000,000.

These thirteen southern states have a total forest area of 222,274,000 acres of the total 416,761,000 acres in the entire country. In other words, these thirteen southern states have more than half the timber area of the United States.

The southern states will be the source from which most of the timber supply of the future will come, because the species of trees and climate in this region provide much more rapid timber production than the north and west. The virgin forests have long since been cut except in the west and there the forests are being rapidly harvested. Once cut it will take 75 to 100 years to bring back their slow growing species to saw timber size. In the meantime, the south will have harvested second or third timber crops from its lands.

What are we going to do about it? The men who are to share in the great future forest wealth are the men who take care of the trees so that they can make their most rapid growth. This means protecting forests from fires for there is no profit in burned over timber lands. It means planting abandoned farm lands to pines or other valuable tree species. It means thinning and perhaps some pruning.

Don't delay. Start today to grow trees for the market that is surely coming.

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Number 2

WOOD REQUIREMENTS OF GEORGIA INDUSTRIES



Figures from Federal Sources Show Georgia Industries Used 427,-190,000 Board Feet in 1928.



The Forest Service of the United States Department of Agriculture recently issued its report on "Lumber Used in Manufacture, 1928". In this report, Georgia is shown to have used in wood manufacture for that year 427,190,000 board feet. The distribution of this consumption by industries is as follows:

Agricultural implements, 2,808,000 board feet; baskets and fruit packages, lumber 10,000, veneer 836,000, bolts 12,674,000; boxes and crates, lumber 38,929,000, veneer 5,744,000, bolts 4,549,000; brooms and carpet sweepers, lumber 4,000, bolts 666,000; brushes, lumber 48,000; car construction and repair 11,368,000; caskets and coffins 2,123,000; chairs and chair stock 7,006,000; dairy, poultry and apiary supplies, lumber 50,000; fixtures, lumber 1,268,000, veneer 214,000; frames and moulding, lumber 84,000; furniture, lumber 8,482,000, veneer 750,000; handles, bolts 4,400,000; instruments, professional and scientific, lumber 110,000; laundry appliances, lumber 5,000; machinery and apparatus, electrical, lumber 22,000; patterns and flasks, lumber 13,000; pencils, pen holders, lumber 15,000; planing mill products, lumber, 247,485,000; refrigerators and kitchen cabinets, lumber, 800,000; rollers, shade and map, lumber, 10,000; saddles, lumber, 222,000; sash, doors, blinds, general mill work, lumber, 65,476,000; ship and boat building, lumber 925,000, bolts 25,000; shuttles, spools and bobbins, bolts 700,000; signs and supplies, lumber 111,000; sporting and athletic goods, bolts, 360,000; toys, lumber 40,000; vehicles (non-motor), lumber 385,000; vehicles (motor), 308,000; woodenware and novelties, lumber 30,000, bolts 3,043,000.

GEORGIA FORESTRY ASSOCIATION WORK



Plan for Annual Meeting at Albany—Pamphlet for Teachers Being Issued—Membership Drive Continues.



The annual meeting of the Georgia Forestry Association will be held this year at Albany, the dates for the meeting not having yet been set. President T. G. Woolford and officers are planning to have a program of outstanding merit.



The Georgia Forestry Association has on the press a pamphlet designed for use of teachers, county superintendents and others in presenting the subject of forestry. It

(Continued on page 2, column 3)



B. HARMAN, Atlanta, Pioneer in Forestry in Georgia, Member of State Board of Forestry and Chairman of the Executive Committee of the Georgia Forestry Association.

CAMDEN COUNTY TIMBER PROTECTIVE ORGANIZATION



How a Large Timber Protective Organization in Georgia is Manned and Operated to Control Forest Fire.



The Camden County Timber Protective Organization was formed in 1929 by consolidating the Satilla Forest and the Bertha Mineral Timber Protective Organizations and adding the Sea Island Company and J. C. Wilson lands. At present, the total acreage listed under protection in this organization is 108,000 acres.

Two new lookout towers have been purchased and erected by this unit, one at Kingsland and the other at Forest View on the Sea Island Company property. These two towers were joined by telephone connection with a third tower at Silco on the Satilla Forest, which has been operated by the Georgia Forest Products Company for some time. The three towers provide lookout service for detecting fires over 150,000 acres of land on the southern half of Camden county, south of the Satilla river.

Under the present plan of operation, fires are located with range finders from each tower. The findings are reported to a central dispatch office at Colesburg where the accurate position of the fire is found on a coordinate map by triangulation. All of this only requires two or three minutes, and once the fire is definitely located a waiting fire truck manned by a fire chief and assistant is sent out to extinguish it.

The fire truck is equipped with a 55 gallon drum of water, several portable water pumps, fire swatters and all tools needed in fighting fire. It is estimated that it will be possible to reach any fire occurring on the area covered within a half hour from the time of its origin.

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 tor of Education and Utilization, Atlanta

Camden County—(Continued)

Fire-fighting forces comprising turpentine labor and woodworkers employed on the different operations supplement the fire truck in suppressing fires, and volunteer crews are enlisted into service whenever needed.

In addition to the tower detection system, approximately 500 miles of fire breaks have been constructed by individual members on their properties.

Fire-fighting equipment is also located on the property of each company in order to promptly suppress fires discovered by their woods crews.

Practically all of the lands under protection in Camden County Timber Protective Organization are industrial forestry operations, some of which are under definite sustained yield management. Turpentine, rosin, saw logs, poles, piling and cross-ties are some of the products now being obtained. Included in the area is a game preserve of 20,000 acres, and another area provides a large part of the material for preservative treatment by a large timber treating plant. All of the member owners consider fire protection of fundamental importance and every effort is made to reduce the fire loss to a minimum.

C. B. Beale, District Forester.



Ware County Jury Commends Forestry

At the December session of the grand jury of Ware county a resolution commending individual timber owners for their constructive work was passed and strict regard for the laws regarding the burning off the woods, was urged.

Ware county is one of the counties of the state that is becoming "forested minded" and developing an appreciation of the fact that the future development of wealth in that region depends in no small measure on how well the forest resources are looked after.

GOAL MILLION MORE PROTECTED AREAS, 1931



Goal Set By State Forestry Board for the Georgia Forest Service in 1931—New District Foresters Authorized.



The Georgia State Forestry Board which directs the Georgia Forest Service, set up as a goal for 1931, one million more acres to be placed under organized fire protection.

Two additional district foresters were authorized, one to be located at Columbus with western middle Georgia as his territory, and one at Albany with southwestern Georgia in his charge. The office of H. M. Sebring, assistant state forester, was moved from Albany to Macon where he could be in easy access to the district foresters in his territory and the general headquarters in Atlanta.

The territory covered by Assistant State Forester Everett B. Stone, Jr., with headquarters at Gainesville was enlarged to cover all of the upper part of the state. He will have two district foresters under his supervision, W. D. Young, Rome, and the new district forester to be located at Columbus.

The Board consists of the following members: Governor L. G. Hardman; George Carswell, Secretary of State; S. W. McCallie, State Geologist; Mrs. M. E. Judd, Dalton, representing women's clubs; C. B. Harman, Atlanta, representing lumber interests; Bonnell Stone, Blairsville; Alex Sessoms, Cogdell, and Leonard Rountree, Summit, representing timber owners; and J. Phil Campbell, Athens, representing the State College of Agriculture.



White Paper from Southern Pines

The United States Forest Products Laboratory located at Madison, Wisconsin, is carrying on experiments in making white paper from southern pines by the sulphite process. It has employed a modified sulphate process with success, concerning the results of which the laboratory says that the kraft pulp made from pine "can be bleached, without loss in strength, to a relatively high white in a two-stage treatment by a modified method, consisting of a chlorination followed by a calcium-hypochloric bleach; the resulting bleached pulp can be used for the production of strong, white paper of high grade".

The sulphite process, however, seems to hold the greatest promise. Some experiments already mentioned in this publication have shown that second-growth pine with little or no heartwood lends itself successfully to the manufacture of white paper by the sulphite process.

On this phase of its work the Forest Laboratory says: "The sulphite process

may offer a solution for pulpwood containing little or no heartwood and experiments in this connection are now under way at the Forest Products Laboratory. Furthermore, employing soda as a base to replace lime in sulphite cooking liquors also eliminates somewhat the objections to the sulphite process with southern yellow pine and this procedure is in use commercially. The sulphite process also offers excellent possibilities in the pulping of various southern hardwoods."



The Tariff Commission is now making studies of the cost of producing pine lumber in the south as a part of the investigation to determine whether the \$1.00 per thousand board feet tariff now existing is high enough to withstand foreign competition.



Ga. Forestry Work—(Continued)

has been felt that there is need for information such as the pamphlet contains for use of teachers in geography, for county superintendents in talks on the subject of forestry; to provide data for students who write essays on forestry, and for various civic clubs that have committees on forestry.



Gordon E. Reynolds, Albany, chairman of the Committee on Membership of the Georgia Forestry Association, is continuing an active campaign for members. He has been working on a list of all leading timber owners in each county in the state as a part of the campaign. An able and convincing letter soliciting membership is being sent out.



T. G. Woolford, president of the Association, was invited to address the Commercial Forestry Conference held at Columbia, South Carolina. Needless to say, he gave the South Carolinians an inspiring message.



A pioneer in forestry work in Georgia is C. B. Harman, chairman of the Executive Committee of the Georgia Forestry Association. Mr. Harman is a native of South Carolina but has been a Georgian since 1895, interested in lumber manufacturing and is a recognized leader in that field.

He is one of those who helped form the Georgia Forestry Association and was among those who fought for the creation of the Georgia Forest Service. He has been a member of the Georgia State Board of Forestry from its inception and none of that organization has given more time and thought to the development of forestry in the state.

It is with pleasure that the photograph of Mr. Harman is herewith presented as the second in the gallery of pioneers and leaders in the forestry development of Georgia.

FOREST RESEARCH IN MOUNTAINS



Southern Appalachian Forestry Experiment Station's Work in North Georgia With Georgia Experiment Station and Georgia Forest Service Cooperating.



By virtue of an appropriation of \$5,000 obtained by United States Senator W. J. Harris, research work in forestry was inaugurated in the mountains of North Carolina under the direction of the Southern Appalachian Forestry Experiment Station of the federal government, being directed from the station's headquarters at Asheville, North Carolina.

The Georgia Experiment Station has offered the forest and facilities it controls at its station in Union county near Blairsville and is cooperating in the project. The Georgia Forest Service is also one of the cooperating agencies.

Initial survey work was made in the summer and fall over a wide area, and plots were established on the forest of the Experiment Station farm where excellent and varied stands were available for more intensive work on the project.

The assistance of Bonnell Stone of Blairsville was obtained in carrying on the work. Mr. Stone has been engaged in forestry work in that region for many years and is enthusiastic over what the research workers are finding.

An effort is being made to enlarge the work started in the mountains so as to extend to the Piedmont region and to include not only forest studies primarily but erosion and land problems as affected by forests in the Piedmont region.

It is the hope of interested Georgians that a sub-station of the one located at Asheville may be established in this state.



State Foresters to Meet in Southeast

The Executive Committee of the National Association of State Foresters has accepted a joint invitation of Georgia and Florida to hold its annual meeting in the southeast in the fall of 1931.

Both Georgia and Florida will be hosts. A part of the session will be held in Georgia and part in Florida.

Field trips are always interesting features of the meetings and arrangements will be made to visit a region where it is said that the owners are more active and progressive in forestry practices than anywhere else in the country.

Local arrangements will be made by B. M. Lufburrow, state forester of Georgia, and Harry Lee Baker, state forester of Florida.

EIGHTH DISTRICT

H. M. Sebring, Assistant State Forester, Albany, Ga.

Southwest Georgia Forest Tower

The first forest fire observation tower in Southwest Georgia was recently erected by the Pine Island T. P. O. near Albany, Georgia. The tower is 60 feet high and is located on a 20 ft. hill, giving the tower an 80 ft. elevation above the general surface level. It has an inside stairway made out of heart cypress and was built by Reynolds Brothers Lumber Company as a lookout for 23,000 acres of cut over land listed for protection in the Pine Island T. P. O.



Pine Forest Management Studies

The Georgia Forest Service in cooperating with Ichaway T. P. O. in Baker County has established two plots as permanent sample plots for the study of forest management for saw-timber and turpentine. The trees were thinned out, on the 1 1-2 acres covered by these plots, to 300 trees per acre. Certain trees were marked as the potential sawtimber trees and the remainder were marked as turpentine trees. That is, they will be worked for turpentine when they reach an 8 inch diameter and then thinned out to give space to the remaining timber trees. These turpentine trees can also be utilized for pulpwood or small poles after they have been worked for naval stores for from 6 to 8 years. It is hoped that some valuable information will be secured on growth and financial return from well managed timberland, since records are being kept of each tree on the plots.



Thinning Demonstration in Tift County

The Georgia Forest Service in cooperation with Mr. W. E. Willis of Chula, Tift County, established a 1.6 acre thinning plot on his land. The site chosen was a thick stand of longleaf pine 15-20 years of age and standing 700 trees to the acre. The trees were too thick and were not making their maximum diameter and height growth, so were thinned down to 300 trees per acre. Each tree was tagged with a number and its diameter recorded. The diameters will be measured yearly over a ten year period so as to determine the increased growth over a similar area that was not thinned, and upon which records are also being kept.



Champion Reforests in Lee County

R. E. Champion of Albany has begun replanting some of his cut over land in Lee

county, that will not seed back naturally. Last year he established a small slash pine nursery to raise planting stock. The 30,000 seedlings that he raised will be planted this winter, and additional seed planted in the nursery for his 1932 planting.



SIXTH DISTRICT

Jack Thurmond, District Forester Savannah

Fire Breaks Costs Held to Low Figure

Plowing fifty miles of firebreaks on 10,000 acres at a cost of only \$85 is a record turned in by C. B. Pfeiffer, Screven County, who is a member of the Brier Creek Timber Protective Organization.

A one-horse turning plow turning three furrows on both sides of the 50-foot strip was used. The estimated cost of burning between these plowed strips is \$2 per mile, making the cost of plowing and burning off the firebreak \$3 per mile.

Mr. Pfeiffer used his own labor which otherwise would have been idle at the time the firebreaks were made. He is using turpentine crews to fight fires.



Gillis Has Perfect Record for Fire Protection

Jim L. Gillis, of the Treutlen County Timber Protective Organization, in three years of protection work has not had a single fire. He has plowed and burned 140 miles of old and new firebreaks on 13,000 acres that support a good growth of slash and longleaf pines. He has also planted several hundred acres in slash pine.

Mr. Gillis finds that after three years of protection, firebreaks are much easier to make and cost only half as much as they did the first year for they are easier to plow and burn out cleaner as the grass is thinner and there are no snags left to scatter fire.

Mr. Gillis has also thinned his timber where he thought it would be beneficial. His work has been so thorough and effective that his neighbors are following his example.

He has posted his forests to call attention to the land being under protection and has a poster which says "Please Do Not Put Fire in These Woods. Soperton Naval Stores Company".



Washington-Booth Memorial

M. M. Booth of Vidalia, Route 1, has planted 200 acres of slash pine in honor of George Washington's birthday. Incidentally, Mr. Booth's birthday is also February 22, so that the new forest might well be a memorial to both. Mr. Booth is a patriotic American and Georgian.

Grazing Land Planted

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Many Farmers Sign Up In Brantley T. P. O.

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The seedlings are dug up in ponds, and range from 6-12 inches in height. The rows are spaced 12 feet apart and the trees planted at 10 foot intervals. Few of the seedlings have died thus far, and a 75 to 80 percent stand is expected.

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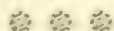
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According to a report of the Forest Service of the United States Department of Agriculture, the wood manufacturing industries of Georgia consumed in 1938 a total of 427,743,000 board feet of lumber. Georgia, however, did not grow all of the wood that was manufactured within its borders. Lumber is brought in from the west, and shipped from the trunks and among the limbs into the state.

As the wood consumed, the premier species of tree to add to Georgia's manufactured woods is the pine, contributing 212,555,000 board feet.

Second in importance is the red gum with 21,755,000 board feet, followed by oak with 21,211,000 board feet. Other leading species are white, yellow, red, and white poplar.

The total native softwoods used in Georgia industries for lumber was 114,514,000 board feet; versus 1,674,000; total 116,188,000; oak, 151,412,000.

Total native hardwoods: Lumber, 11,400,000 board feet; versus 1,000,000; total 12,400,000; total, 12,400,000 board feet. Total foreign woods, 42,000 board feet.

The list of species of trees and the amount of each used in wood manufacture of Georgia are as follows:

Red cedar, lumber, 10,000 board feet.

Western cedar, lumber, 10,000.

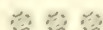
Yew, lumber, 1,000,000; total, 11,000.

Douglas fir, lumber, 1,421,000; versus 1,400,000.

Pine, lumber, 212,555,000; versus 4,412,000; total, 216,967,000.

(Continued on page 2, Col. 1)

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A resolution was approved to receive suggestions offered and to present a program. Several speakers of national reputation were mentioned for plans on the program and the afternoon is to be given for demonstrating forestry practices in the woods.

(Continued on page 2, Column 1)



Mr. W. E. Lott, former agent of Forest Service, Georgia, and of Georgia Forestry Association.

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The Timber Protective Organizations have the threat and actual control that would immediately destroy all forest land. They have the power to prevent any fire from starting. They have the power to prevent any fire from spreading. They have the power to prevent any fire from burning. They have the power to prevent any fire from being a threat to the forest.

Timberlands are established in Georgia from time to time for burning. Burning is a necessary part of the forest management process. It is a process that is necessary for the growth and health of the forest.

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As one would suspect, the premier species of tree to add to Georgia's manufactured wealth is the pine, contributing 342,551,000 board feet.

Second in importance is the red gum with 21,753,000 board feet, followed by oak with 21,215,000 board feet. Other leading species are ash, cypress, tupelo and yellow poplar.

The total native softwoods used in Georgia industries for lumber was 336,056,000 board feet; veneer, 4,479,000; bolts (logs) 11,280,000; total, 351,815,000.

Total native hardwoods: lumber, 57,099,000 board feet; veneer, 3,055,000; bolts (logs) 15,139,000; total, 75,293,000 board feet. Total foreign woods, 82,000 board feet.

The list of species of trees and the amount of each used in wood manufacture of Georgia are as follows:

Red cedar, lumber, 10,000 board feet.

Western cedar, lumber, 15,000.

Cypress, lumber, 5,092,000; bolts, 431,000.

Douglas fir, lumber, 1,425,000; veneer, 10,000.

Pine, lumber, 327,233,000; veneer, 4,469,000; bolts, 10,849,000.

(Cont'd on page 2, Col. 1)

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(Continued on page 2, column 2)



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The Timber Protective Organizations have fire towers and patrol systems that permit immediate detection of fires when they start. Arrangements exist whereby crews of men who are subject to fire fighting service are instantly assembled and rushed to fire, men who are equipped with fire fighting appliances and have plans of procedure by which fires can be quickly brought under control.

Firebreaks are established to check fires or form basis for backfiring. Everything is systematically planned for effective fire fighting just as exists for a city fire department.

The 234 fires on the protected areas could easily have burned unhindered and swept over many more thousands of acres than the 13,613 acres burned, with great loss to the owners, but the minute men were on the job to stop them.

It would be interesting to know what

(Continued on page 2, column 1)

GEORGIA FOREST SERVICE

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GEORGIA FOREST SERVICE
 State Capitol Atlanta, Ga.
 C. A. Whittle, Editor

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 H. M. Sebring, Asst. State Forester, Macon
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 W. G. Wallace, District Forester, Columbus
 Mrs. Nellie Nix Edwards, Secretary to the State Forester Atlanta
 Miss Clifford Sims, Secretary to the Director of Education and Utilization, Atlanta

Georgia Timber—Cont'd.

Western pine, lumber, 807,000.
 Red wood, lumber, 16,000.
 Ash, lumber, 222,000; bolts, 6,176,000.
 Basswood, lumber, 43,000; bolts, 1,000.
 Beech, lumber, 1,100,000.
 Birch, lumber, 709,000.
 Cherry, lumber, 3,000.
 Chestnut, lumber, 110,000; veneer, 15,000.
 Cottonwood, lumber, 125,000.
 Elm, lumber, 302,000.
 Hickory, lumber, 481,000; veneer, 12,000.
 Maple, lumber, 105,000; veneer, 6,000; bolts, 150,000.
 Oak, lumber, 21,082,000; veneer, 108,000; bolts, 25,000.
 Persimmon, lumber, 14,000.
 Red gum, lumber, 14,064,000; veneer, 2,291,000; bolts, 5,398,000.
 Sycamore, lumber, 1,757,000; bolts, 600,000.
 Tupelo, lumber, 6,869,000; bolts, 1,487,000.
 Walnut, lumber, 166,000; veneer, 90,000.
 Willow, bolts, 194,000.
 Yellow Poplar, lumber, 9,947,000; veneer, 535,000; bolts, 1,108,000.
 Mahogany, lumber, 72,000; veneer, 10,000.



Georgia T. P. O.'s—Cont'd

caused the fires. Here are the causes and the number due to each cause: Lightning, 11; railroads, 16; campers, 8; smokers, 8; debris burning, 4; incendiary, 70; lumbering, 7; miscellaneous, 42; unknown, 68.



Essay Contest in Bacon County

An essay contest on the subject "Why Woods Burning Should be Stopped", has been inaugurated in Bacon county by J. T. Altman, county superintendent.

Forestry Assn.—Cont'd

The president of the association is T. G. Woolford, of Atlanta. C. B. Harman, Atlanta, chairman of the Executive Committee, presided.

Other business of the committee consisted of reports showing active work being carried on by the association in many lines relating to forestry interests.

A. A. Doppel of the United States Chamber of Commerce, Washington, D. C., an invited guest, made helpful suggestions regarding the program.

The full details of the annual meeting will appear in the next Lookout.



Mrs. Judd Forest Enthusiast

The third in our gallery of pioneers of forestry in Georgia is Mrs. M. E. Judd, Dalton, the two preceding being Mr. Bonnell H. Stone and Mr. C. B. Harman. Mrs. Judd is by profession a landscape architect and is, of course, a lover of trees and shrubs. On her own estate near Dalton she is practicing forestry as well as promoting it over the state.

As chairman of the Committee on Forest-Parks of the Georgia Forestry Association, Mrs. Judd is called upon for advice as to developing the recreational and aesthetic features of town forest-parks. One of her latest contributions of this sort has been to the town of Newnan.

Mrs. Judd is a highly valued member of the Georgia State Board of Forestry, which board directs the activities of the Georgia Forest Service. In this position, she represents the women's clubs of Georgia. She is an active member of several women's organizations and chairman of the Forestry Committee of the Georgia Federation of Women's Clubs. In recognition of her position in the South, she was invited to preside at an important session of the National Association of State Forest-Parks held last year. In other organizations she is receiving national recognition.

It has been the good fortune of Mrs. Judd to travel in various parts of the world and to study park developments and landscaping. Her equipment is, therefore, exceptional and with it she has the quick perception and sound judgment that has made her a valuable executive in the Georgia State Board of Forestry.



Conservation Committee Meet

During the extraordinary session of the Georgia Legislature the conservation committee was entertained at dinner by T. G. Woolford, president of the Georgia Forestry Association. The work being carried on in forestry in the state was presented in a comprehensive way by State Forester B. M. Lufburrow. The work of the Association was outlined by Mr. Woolford and C. B. Harman, Bonnel H. Stone and Joseph McCord spoke briefly. Hon. Emmett Wil-

liams, senator, spoke the appreciation of the legislators for the work being done in forestry.

Mr. Woolford also made a very interesting report on the progress of the Canal Commission which is working for federal aid in constructing a canal connecting the Mary's and Sewanee rivers to complete the project of intercoastal navigation of the Atlantic and Gulf coasts.

The guests were greatly pleased with the helpful information presented at the dinner.



In a recent interview given the "Commercial Appeal", of Memphis, Tennessee, Gordon E. Reynolds, Albany, Georgia, said among other things: "Next to cotton, lumber is the South's greatest product in value and yet little is being done to provide for the future supply. One hundred million acres in the South are better suited to growing timber than anything else and should be utilized for that purpose".

Mr. Reynolds, who is chairman of the membership committee of the Georgia Forestry Association, was recently made president of the Southern Hardwood Club at a meeting held at Jacksonville.



Town Forest Affords Employment

The City of Newnan has been conducting a cutting operation on its town forest in order to provide employment for men who are out of work. They were paid for their work and given fuel wood for home consumption. Others who are not so badly in need of employment are permitted to cut fuel wood free of charge. The wood cut is distributed to the needy of the city and has proved a great blessing during cold weather.

An average of 25 men were employed for a period of three weeks the trees cut and removed are dead and badly diseased trees or inferior species so that the forest stand is being improved by this operation.

This work is being done under the direction of Mr. H. H. North, Chairman of the Water and Light Commission, and is a part of the general plan for the improvement of the city watershed which is being managed as a town forest. It is the policy of Mr. North to continue this work, and the forest area of city property will supply labor and fuel wood for a number of men every year. This is a much worth while project and Mr. North is to be complimented on its initiation.



Lewis E. Stanley resigned his position as state forester of South Carolina to accept the position of Secretary of Forests and Waters of Pennsylvania. He has been succeeded in South Carolina by H. A. Smith who comes from the position of Assistant State Forester of Florida.

NEWNAN ESTABLISHES TOWN FOREST



Recreational Center and Demonstration Forest of 800 Acres To Be Developed.



Through the efforts of Mr. H. H. North, Chairman, and other members of the Newnan Water and Light Commission, a Town Forest has been established on lands owned by the City of Newnan for watershed of the municipal water supply. The area embraces some 800 acres.

The Georgia Forest Service has made a forest survey of the property and prepared a plan of management which will secure complete reforestation of the city watershed and a proper management of the property for the production of wood and water.

Some 250 acres of open land will be planted to desirable forest trees, the planting operation to extend over a period of five years.

The existing stand will be improved by the removal of the dead and damaged trees and the inferior species. This will result in increasing the growth of the remaining stand and encourage the establishment of the more valuable species.

The city owns the entire watershed and a pure supply of water is assured. By the establishment of a forest cover over the entire area the run off of rain water will be controlled and a more uniform stream flow secured. The city already has one of the most modern water supplies of any municipality in the state and this policy will still further improve it.

A portion of land bordering the LaGrange highway has been set aside as a park area and is being beautified by the planting of ornamental shrubs and trees. This work is being done under the immediate direction of Mrs. M. E. Judd of Dalton, Georgia. Mrs. Judd is an experienced landscape engineer and has charge of the beautification of State Forest-Parks as a member of the Georgia State Board of Forestry and Georgia Forestry Association.

Approximately 800 ornamental trees, shrubs and plants have been set out this spring already and plans call for the planting of many more. Plans call for the construction of a roadway through this portion and the establishment of a number of the beautification of the park area.

A committee of ladies with Mrs. Davis as chairman has been formed to encourage the beautification of the park area and improvements.

Mr. H. H. North, Chairman of the Water and Light Commission, should be given credit and praise for initiating and carrying out of this project.

Everet B. Stone, Assistant State Forester.

FIRST DISTRICT W. B. Young, District Forester Rome

Berry School Plants Pines

Berry Schools will plant 15,000 loblolly pine seedlings this spring which were grown in their own forest nursery.

Additional seeds will be planted for the 1932 planting season.



New School Forest

A new school forest has been established at Dawnville High School, in Whitfield county. Mr. I. E. Carson who was formerly a teacher at Eatonton, Georgia, is vocational teacher at Dawnville. All students are enthusiastic over learning something of forestry practice.



Dalton Town Forest

An unusually heavy stand of young pines covers 12 acres of the Dalton Town Forest. The total amount of land in this forest embraces 25 acres, 13 of which are open land.

It has been estimated that there are about 6,000 trees per acre on the 12 acres, and the stand is 10 to 12 years old.

Sample thinning plots have been marked for cutting which will begin this winter.



Rome To Have Town Forest

A town forest will be established at Rome, Georgia. The donor of this forest is Miss Frances Andrews, who at her death, bequeathed to the City of Rome the royalties from books published by her for a period of 5 years for the establishment of a town forest.

Miss Andrews was an eminent botanist, known over the country, and published books on this subject.



Georgia Red Cedar in Demand For Northern Markets

An inquiry received by the Georgia Forest Service from a Pennsylvania concern asking for locations of red cedar stands was referred to the first district.

A notice was sent to county agents in that district asking them to get in touch with landowners who might have red cedar to sell.

Dade county, according to estimates made, has the largest amount of red cedar of any county in Georgia. Leaders in that county were put in touch with the Pennsylvania concern with prospects of developing considerable business.



Highway Demonstration Area Brings Results

Among the highway demonstration plots established last fall by the Georgia Forest Service in cooperation with local civic organizations, was one near Rome on the Atlanta highway, established in cooperation

with the Rome Chamber of Commerce.

This area embraces about three acres. The district forester thinned and pruned about one-half acre of this area. The owner of the area, Mr. R. F. Jolly, decided that the pruned and thinned portion looked so well that he sent a crew of men and had the entire area pruned and thinned.



SIXTH DISTRICT Jack Thurmond, District Forester Savannah

Plantings in Evans County

Mr. Waldo Bradley of Hagan, Georgia, Evans county, is planting 1,500 acres in slash pine this year. Mr. Bradley is the owner and operator of a stave mill at Hagan and also owner of several thousand acres of land which he has planned to plant in slash pine. The work is being done under supervision of the Georgia Forest Service.



County Police Aid Sought

Mr. J. M. Fraser, a member of the Liberty County Timber Protective Organization, appealed to the county commissioners of that county to have the county police help in detecting and suppressing forest fires on the protected land.



O'Connor Plants Extensively

Mr. J. B. O'Connor of the Oconee Timber Protective Organization is very enthusiastic over his protection work. He believes in it so strongly that he has planted 2,000 acres of slash seedlings and is building firebreaks on 5,000 acres. Mr. O'Connor has planted many abandoned fields and pastures in slash pine and has also planted them on cut-over land. He is not waiting for the seed trees which were left to reseed the area but is helping to get a stand of desirable timber back in shortest time possible. He reports no fires on any of his timber since protection work began one year ago. His firebreaks will be plowed instead of the usual plowed and burned strip.



SEVENTH DISTRICT C. Bernard Beale, District Forester Waycross

Bacon County Wants Fire Protection

Meeting with a small group of interested Bacon county citizens at Alma on February 14, District Forester Beale outlined the state fire control work under the Timber Protective Organization plan. J. T. Altman, county school superintendent, with the district forester arranged the meeting after an educational campaign among the county schools. Mr. Altman has devoted much time and effort to securing organized fire control in Bacon county and his unselfish efforts are to be commended.

While no Timber Protective Organization was formed, a number of individual contracts were signed by those present, about 2,000 acres being listed at the meeting with several present agreeing to work in their communities to secure additional members. Another meeting to complete organization will be held as soon as sufficient acreage is secured to comply with the minimum requirement for a Timber Protective Organization (10,000 acres).



Colonel Benedict Runs Germination Experiment

When pine masts lodge in soft, loosened prepared soil, the result is quick germination and vigorous seedlings. On this theory, Colonel R. E. Benedict, Brunswick-Peninsula Company forester, plowed furrows 30 to 50 feet apart on a small area of the company's forest land two years ago. A recent inspection shows that abundant seedlings are appearing along the furrows in certain sections of the ploughed territory. On other furrows, few or no seedlings have appeared.

Colonel Benedict says: "All we can do is to make the conditions optimum. Uniformity of natural reproduction is controlled by chance lodgment of seed."

The possible results of land preparation are quick germination, uniform establishment of dominant seedlings, fire damage minimized, drainage, fewer trees to thin and more rapid growth.



Controls Break Burning With Fire Pump Instead of Plowed Furrows

More man and water power, less mule and tractor power, is the idea of W. W. Turner, Mayday (Turner & Langdale) when it comes to burning strip fire breaks.

With four men carrying water pumps, one man stringing fire, two men with swatters, on land rough several years a good fire break can be satisfactorily burned without furrows, Mr. Turner states. An enthusiastic timberman, Mr. Turner gets his neighbors interested by helping them burn their breaks.



TWO NEW DISTRICT FORESTERS FOR GEORGIA

Beginning with February 1, two new district foresters were added to the staff of the Georgia Forest Service. H. D. Story at Albany, and H. G. Wallace at Columbus.

Mr. Story is a graduate of the School of Forestry of Louisiana State College and has had several years of experience, being located for some time in Georgia where he was employed on the Southern Forestry Educational Project.

Mr. Wallace is a native of Georgia and graduate of the Department of Forestry of the Georgia State College of Agriculture, and has had experience with a

Mr. Story occupies an office in the Chamber of Commerce room at the Gordon

hotel, Albany, the office vacated by H. M. Sebring, assistant state forester, whose office has been moved to Macon.

The office of Mr. Wallace is in the Chamber of Commerce rooms at Columbus. large timber concern of the South.



Students Plant Highway Trees

The vocational students of the Palmer-Stone Consolidated School at Oxford who have a school forest volunteered their services in planting shade trees along the highway from Covington toward Madison. According to C. N. Elliott of the Georgia Forest Service who directed the work, the boys did a good job, showing that they knew how to practice what they had been taught. Pines, dogwoods and myrtles were planted.



Hollywood School Erects Cabin On Forest Plot

H. J. McCurry, Jr., of the Hollywood School in Habersham county reports the construction of a cabin in the school forest. This is to be used as a clubhouse for forestry work and for meetings of the local chapter of Future Farmers of Georgia. The cabin is erected on a mound thrown up by gold miners in 1889. A swimming pool is to be made near by.

Under the direction of Hugh A. Inglis, teacher of vocational agriculture, the boys have erected a work shop, landscaped the school grounds, put up large rock columns at the school entrance.

It is regretted that limited space prevents reproducing in full the interesting and well written report sent in by young McCurry.



Indian Springs Forest Park Enlarged

Through the liberality of citizens of Butts county, led by the Kiwanis club, the area of the state forest park at Indian Springs has been doubled, giving needed space for the development of the recreational value of the historic spot. Judge Ogden Persons of Forsyth was a large contributor to the purchase fund and is one of the members of the advisory committee on state forest parks.

The Indian Springs property is under the management of the Georgia Forest Service which is making improvements on the property as funds become available. The latest improvement undertaken is the construction of a foot bridge from the highway to the spring, to replace an old structure now falling into decay.



Planting and Thinning In Laurens County.

Perry Brothers, Dublin, Georgia, leading dairymen of South Georgia with a wide reputation for establishing carpet grass and lespedeza pastures have entered a new role and are now planting surplus land in

FORESTRY SUMMER CAMP IN GEORGIA MOUNTAINS



Students and Teachers from Vocational Agricultural Schools to Study Forestry at Young Harris College and Make Excursions into Mountains.



Arrangements have been made to have Vocational Forestry Camp for three weeks at Young Harris College in the mountains of North Georgia, beginning about August 1, the definite dates to be decided later on.

Provisions have been made for financing the expenses of one boy from each county having a white vocational school and for several vocational teachers. Others can attend by paying their own way or raising funds locally for expenses.

Three weeks of forestry work, mainly in the woods, will train the boys in tree identification, estimating the volume of standing timber, fire control, uses of woods, thinning, harvesting and tree planting.

Teachers and students are enthusiastic over the prospects of spending three weeks in pleasant and profitable study of forestry and excursions to interesting points in the mountains. The program of work and excursions is now being made out.



Students Make Fire Surveys

Each white rural consolidated school in the state is engaged in making reports of forest fires in the regions in which the schools are located. Cards for recording acreage burned over and cause of each fire are provided by the Georgia Forest Service. In this way, considerable data will be obtained on forest fires in Georgia.



Round of School Forest Demonstrations.

Members of the staff of the Georgia Forest Service are now making another round of school forests to give demonstrations. This time, thinning, estimating the board feet in standing timber and uses of woods are being demonstrated.



School Forest Cabin

The Georgia Industrial School at Barnesville has recently constructed a cabin on its school forest. Here meetings of the forestry club are held and tools for forestry work are kept. The building was erected by the boys of the school. This school is one of the foremost in forestry activity in the state.

slash pine, recently planting 20,000 seedlings. A demonstration in thinning a thicket of pines was given on their lands by C. S. Trowbridge, Extension Forester.

GEORGIA FOREST LOOKOUT

Volume 1

ATLANTA, GA., APRIL, 1931

Number 4

FORESTRY ASSOCIATION PROGRAM ANNOUNCED



Noted Speakers to be Heard at Albany, May 20 and 21, on Practical Subjects — Field Demonstrations Will Feature Afternoon of Second Day—Tentative Program Given.

The tenth annual session of the Georgia Forestry Association will be held at Albany, May 20 and 21. A program of outstanding interest has about been perfected. Eminent authorities will deal with practical subjects and point the way to the development of great potential forest resources of Georgia.

The public is invited to attend all sessions of the association meeting and the field demonstrations where important phases of fire control and forest management will be given.

Senator William Harris will attend and Governor Franklin Roosevelt has been invited.

The officers of the Georgia Forestry Association are: President T. G. Woolford, Atlanta; First Vice-President Mrs. M. E. Judd, Dalton; Second Vice-President S. H. Morgan, Guyton; Third Vice-President Dr. W. M. Folks, Waycross; Treasurer Joseph A. McCord, Atlanta; Secretary Bonnell Stone, Blairsville; Chairman of the Executive Committee C. B. Harman, Atlanta. Other members of the Executive Committee are H. L. Kayton, Savannah; A. K. Sessoms, Cogdell; Mrs. Nora L. Smith, Ashburn; Col. R. E. Benedict, Brunswick; James B. Nevin, Atlanta; Miss Emily Woodward, Vienna; Gordon E. Reynolds, Albany; B. C. Milner, East Point; Judge Ogden Persons, Forsyth; W. T. Anderson, Macon.

The local committee at Albany in charge of convention arrangements is composed of W. H. Burt, J. P. Champion, J. B. Davis, Percy Price, J. W. Reynolds.

The tentative program is as follows:

Program

Morning Session 10:00 o'clock (Central T.)

(Continued on page 2, column 1)

GEORGIA'S LOST TREE OF ALTAHAMA SWAMPS



Bartram Discovered Tree One Hundred and Fifty Years Ago and Progency Now Scattered Over World, But Original Has Never Been Found Again.

William Bartram records in his "Travels", the discovery and naming of the Franklinia (Gordonia alataamaha) as follows: "... I employed myself in revisiting the several districts of Georgia . . where I noted the most curious subjects: collecting them together and shipping them

(Continued on page 2, column 2)



T. G. Woolford, President of Georgia Forestry Association. A public spirited business man who has taken time to render valuable service to the cause of forestry in Georgia.

CHICOPEE COMPANY PLANTS PINES



The Chicopee Manufacturing Company, near Gainesville, recently planted 20,000 loblolly pine seedlings on abandoned farm land within their holdings.

This planting operation is conducted under plans prepared by the Georgia Forest Service for the management of their three thousand acres of forest land which they have under organized fire protection.

All open lands which will not restock within a reasonable time are being planted, the idea being to convert the entire area to forest as rapidly as possible.

This is the third year in which planting operations have been conducted and is a regular part of their forestry program.

Seedlings were purchased from the State Nursery at Athens, Georgia.

Grand Jury of Chatham

County on Fire Measures

At a recent meeting of the grand jury of Chatham county in presentments made to Judge Peter Meldrim, special attention was given to report of the forest fire prevention committee. Recommendations were made that a truck be equipped by the county for forest fire fighting, that a forest fire lookout tower be erected and manned to detect and report fires and that trusty convicts under a guard be rushed by the truck to suppress the fires before they make headway.

Value of School Forests

Commenting on the work of the Lumpkin High School Forest, which is one of more than a hundred similar school forests in Georgia, the Columbus Enquirer-Sun says editorially: "The education of the children of the country so that they will appreciate the value of forests and will take part in the planting and care of them is our greatest hope. The work at the Lumpkin school and others in the state is prophetic of forest culture on a large scale in Georgia".

GEORGIA FOREST SERVICE

Published Monthly By
GEORGIA FOREST SERVICE

State Capitol Atlanta, Ga.
C. A. Whittle, Editor

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W. D. Young, District Forester.....Rome
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W. G. Wallace, District Forester,
..... Columbus
Mrs. Nellie Nix Edwards, Secretary to the
State ForesterAtlanta
Miss Clifford Sims, Secretary to the Direc-
tor of Education and Utilization, Atlanta

Forestry Assn.—Cont'd

Presiding—T. G. Woolford, Atlanta, Ga.
Invocation—Rev. Reese Griffin.
Welcome—Mayor J. S. Billingslea.
Response—President T. G. Woolford, Ga.
Forestry Association.

1. *What Forestry Means to Georgia*—Mr.
W. T. Anderson, Macon, Ga.
2. *Progress and Plans in State Forestry*—
Mr. B. M. Lufburrow, State Forester,
Atlanta, Ga.

3. *Research Aids to Georgia Forest Own-
ers*—
Pine Belt—Mr. E. L. Demon, Dir., U.
S. Forest Experiment Station, New
Orleans, La.

Hardwood Belt—Dr. C. R. Hursh, For-
est Ecologist, Appalachian Forest
Station, Asheville, N. C.

4. *A Railroad's Experience in Fire Pro-
tection*—Mr. Roland Turner, Atlanta,
Ga.

Business Meeting.
Open Discussion.

1:00 P. M. Luncheon Conference—Com-
mittee meetings.

Afternoon Session—2:30 (C. T.)

Presiding—Mr. H. L. Kayton, Savannah,
Ga.

5. *Law Enforcement in Fire Protection*—
Judge Ogden Persons, Forsyth, Ga.

6. *Tiny Living Cells Today Build Multi-
Product Pines*—Dr. Eloise Gerry, U.
S. Forest Products Laboratory, Mad-
ison, Wis.

7. *Timber and Railroads*—S. R. Young,
Asst. Chief Engineer, A. & W. P. Rail-
road, Atlanta.

8. *New Sources of Wealth for the South*—
Dr. Charles Hert, Industrial Chemist,
New York, N. Y.
Open Discussion.

Banquet 7:30 P. M.
Toastmaster—Mr. G. E. Reynolds, Albany,
Ga.
Addresses.

Second Day

Morning Session 10 o'clock
Presiding—Mr. I. F. Eldredge, Fargo, Ga.

9. *Permanent Foundations for Forest In-
dustries.* (To be selected).
 10. *The Forest Tax Situation*—Mr. J. A.
Davis, Albany, and Mr. George Rom-
mel, Savannah, Ga.
 11. *Reaching the Man Who Owns the For-
est*—Mr. Austin Carey, U. S. Forest
Service, Starke, Fla.
 12. *Forestry Education in the Schools*—
Mr. Paul Chapman, Athens, Ga.
 13. *Training Foresters for Georgia*—Mr.
G. D. Marckworth, Athens, Ga.
- Business Meeting.
Open Discussion.
Afternoon Session 2:00 o'clock
Forestry Meeting of the Public Schools.
Field Demonstrations.
Assistant State Forester H. M. Sebring,
Macon, Ga.



T. G. WOOLFORD LEADER IN FORESTRY DEVELOPMENT

T. G. Woolford, Atlanta, President of
the Georgia Forestry Association, business
leader and public spirited citizen, has
given time, money and rare executive
ability to the promotion of the interests of
forestry in Georgia. His sound judgments,
ability to see through a proposition and to
clarify and simplify conclusions has won
for him the admiration of associates in the
Georgia Forestry Association. His valu-
able services to forestry merits the grati-
tude of the whole state.

Mr. Woolford is President of the Retail
Credit Company, member of a number of
civic organizations, chairman of the At-
lantic-Gulf canal commission of the state
in which capacity he has been very active
and influential in presenting every claim
favorable to the construction of this pro-
posed waterway, leaving nothing undone
to accomplish the desired ends.

Mr. Woolford is a native of Maryland, a
Georgian for many years, an acquisition of
which the state may well be proud, for few
indeed are rendering Georgia as valuable
service as he.

The cause of forestry is fortunate in
enlisting his services. It is, therefore, with
a feeling of pride that the Georgia Forest
Lookout presents his likeness in its gal-
lery of forestry notables of the state in
this issue.



Lost Tree—Cont'd

to England. I had the opportunity of ob-
serving the new flowering shrub, resem-
bling the *Gordonia*. On first observing
the fructification and habit of this tree, I
was inclined to believe it a species of *Gor-
donia*; but afterwards, upon stricter ex-
amination, and comparing its flowers and
fruit with those of the *Gordonia lasianthus*,
I presently found striking characteristics
abundantly sufficient to separate it from
that genus, and to establish it the head of
a new tribe, which we have honoured with
the name of the illustrious Dr. Benjamin
Franklin. *Franklinia Alatomaha* . . . This
very curious tree was first taken notice

of about ten or twelve years ago, at this
place, when I attended my father (John
Bartram) on a botanical excursion; but, it
being then late in autumn, we could form
no opinion to what class or tribe it belong-
ed. We never saw it grow in any other
place, nor have I ever seen it growing
wild, in all my travels, from Pennsylvania
to Point Coupe, on the banks of the Miss-
issippi, which must be allowed a very sin-
gular and unaccountable circumstance; at
this place there are two or three acres of
ground where it grows plentifully."

Cuttings from this plant discovered by
William Bartram were taken to his father
who then lived in Philadelphia where it
was planted in the city park and today is
to be seen there in the Arnold Arboretum
of that city. As Bartram mentioned, some
of the cuttings also went to England where
they were placed in cultivation.

Botanists following William Bartram de-
termined the *Franklinia* to be a true *Gor-
donia*, as Bartram at first thought it to be.
Today this plant bears the scientific name
of *Gordonia alatomaha* with its discover-
er's scientific name, *Franklinia*, as its com-
mon name.

As Bartram suggested in his "Travels",
the occurrence of this species is "singular
and unaccountable". It has never been
found native anywhere else in the world
except on these few acres in the Altamaha
swamps. It is a tree that has been hidden
in the semi-tropical vegetation of southern
Georgia for over a hundred and fifty years.
Many have sought for the tree without
success.

One wonders how such a plant came in-
to existence and why it was confined to
only two or three small acres on the wide
face of the earth. One also wonders if
the tree wages a losing fight for its place
in the plant world as the common chestnut
of the mountains (*Castanea dentata*) is
now doing, or if it had just begun to live
and had conquered and spread its canopies
over only a small domain of a few acres
when Bartram discovered it.

Charles Newton Elliott.

Naval Stores Loans

Senator Walter F. George succeeded in
getting his bill entitling naval stores to re-
ceive federal loans from the Farm Relief
Board passed through the short session of
Congress. It got through as a rider on
the oleomargarine bill. The bill was ap-
proved by President Hoover.

What Fire Did to Pine Growth

A report from the Ty Ty school which
has a school forest, in the Moultrie Obser-
ver, tells of measurements made on burned
and unburned sample plots. On the burned
area the growth in height of young trees
was 15 1-2 inches, whereas on the un-
burned area the growth was 40 inches.
This is one of the lessons taught by the
vocational schools' demonstration forests.

GORDON D. MARCKWORTH NEW HEAD GEORGIA FORESTRY SCHOOL

Professor Gordon D. Marckworth has been elected head of the Forestry Division of the Georgia State College of Agriculture at Athens to succeed Professor T. D. Burleigh now located at the Appalachian Forest Experiment Station at Asheville.

Professor Marckworth obtained his degree of Bachelor of Science in Forestry from the Ohio State University in 1916 and his Master's Degree in Forestry from Yale in 1917. Since that time, he has held the position of Assistant state forester of Virginia, saw service in the World War and then he was sent from the A. E. F. to attend the University of Edinburgh in Scotland where he studied British forestry methods and conditions.

He was elected assistant state forester of Texas in the spring of 1920 and in the summer of 1921 resigned this position to organize and take charge of the forest protection work in Tennessee. After two years in this position, Professor Marckworth resigned to spend a year in commercial work and then resumed his activities in forestry as assistant state forester in charge of protection in Maryland. From the Maryland Forest Service, Professor Marckworth resigned to take the position of Associate Professor of Forestry in the Louisiana State University, and two years later was made head of the forestry department of that institution, which position he held until coming to the Division of Forestry of the College of Agriculture at Athens.

Professor Marckworth is a Senior Member of the Society of American Foresters and during the past year has been chairman of the Gulf States Section of this Society. He was also a member of the State Forestry Board in Louisiana.



Gordon D. Marckworth, Head Forestry School

INCREASED TREE PLANTING

Most of the tree planting in Georgia occurs in late winter and early spring. This year more trees were planted than for any previous period.

From such records as are available, it is estimated that 4,000,000 trees were planted in Georgia this year. Nearly two million seedlings grown at the state tree nursery were sold. Several large timber owners conduct their own tree nurseries and have made extensive plantings. A number of vocational schools have operated tree seed beds and planted the seedlings they grew. Commercial tree nurseries in other states have shipped into Georgia a large number of seedlings. In addition, quite a number of timber owners have transplanted seedlings from the woods or borders of fields to open places.

More slash pine than any other species has been planted, followed in their order by loblolly and longleaf pines. Hardwood plantings have been small, among leaders are black locust, ash, yellow poplar, red gum and walnut.

FIRST DISTRICT W. B. Young, District Forester Rome

Reinhardt College to Plant on Large Scale

Reinhardt College, at Waleska, Georgia, plans extensive forest planting for next year. Under the supervision of Mr. L. T. Hagood, vocational teacher, four 4 by 12 feet beds have been constructed and will be planted to loblolly pine, black locust, white ash and yellow poplar. Mr. Hagood plans to carry out the forestry project on a larger scale than is called for in the regular school forest, eventually planting all the abandoned and poor land of the school property to forest trees.



Johnson Lines Up Tenants to Fight Fire

Mr. Bill Johnson, one of the patrolmen of the Ellijay Timber Protective Organization, says that good protection has resulted by requiring all renters who farm any open land in the T. P. O. area to sign a written contract with the distinct understanding that timber lands must be kept free from fire, and at any time the tenant is subject to call to fight fire should one break out on the protected area.

According to the Bureau of Census of the United States, yellow pine continues as the leading commercial wood of the country. The consumption of leading commercial woods is as follows: yellow pine, 11,203,238,000 board feet; Douglas fir, 8,688,700,000; western yellow pine, 3,288,237,000; oak, 2,542,700,000; hemlock, 2,075,194,000; white pine, 1,325,450,000;

SIXTH DISTRICT

Jack Thurmond, District Forester
Savannah

Stafford's Experience With Fire Breaks

In September, 1930, the Liberty County Timber Protective Organization was formed and included 17,145 acres of cut-over and burned land. The job of building fire-breaks and patrolling for fires was undertaken by Mr. W. I. Stafford, a native of Liberty county, and a believer in rough woods. He has worked faithfully, and some of his experiences and views on fire-break construction are given in the following statement:

"I have been plowing and burning out fire-breaks since the first of last November. We have used the method prescribed by the Georgia Forest Service. I have given this work my best thought and consideration, and have not been able to devise or invent a better or more economical fire-break than the method prescribed by them. We use a double disc plow drawn by a 15-30 International tractor. The woods were rough and full of lightwood stumps. Had the misfortune of breaking the plow several times. However, the plow did real good work, and so the burning out was not so hazardous.

"We tried to make our break 50 to 60 feet wide, burning out between furrows. Found we had less trouble with fires catching out behind us when we had the dirt thrown from the break. When thrown to the break, fire gets under the turf, burning rotten wood and dry grass, sometimes catching out after the crew has been gone for several minutes. We find that fire-break construction must be done well, burned out clean, and be well connected. Woods fires can be controlled, but it requires well organized effort on the part of all members and the larger the membership the better."

Burning Firebreaks on contract by the mile is popular in Liberty County Timber Protective Organization.

Work on firebreaks on this T. P. O. was done on a day basis, \$5.00 per day being allowed on the tractor and plow. Mr. Stafford let contracts to local men for the burning out the strips which were from 30 to 50 feet wide, at \$1.50 per mile. This is a very cheap rate for if undertaken on a per-day basis they usually cost \$3.00 or more for burning per mile.



Overstreet Transplants Pines

Mr. M. V. Overstreet, a farmer, turpentine man, cattleman, and timberman of Manasas, Georgia, Tattnall county, has planted 125 acres in slash pine during the last two years. He used slash seedlings from two to three years old, lifting dirt and all on the roots and transferring them on trucks to the field where the planting was to be done. These seedlings were growing wild in the woods where fire had been kept off for a number of years. He made his planting holes with a shovel or spade and cut the tap root back to about six inches long. Planting the seedlings in this manner and packing the ground down firmly around them over 95 percent of them lived. Trees were spaced 8 by 12

Schools Plant Pines

In the school forests of vocational schools of District 6, many slash pine seedlings were planted this year. One of the best plantings was on the school forest of the Soperton High School where 4 acres were planted. They intend to do some re-foresting each year until they have planted 20 acres as they have that much space to devote to planting. The school forest area was given by Mr. James Fowler, the "Georgia Timber Farmer".



Cheaper Than Raking

Mr. M. H. Newsome, a member of the Treutlen County Timber Protective Organization, has constructed fire-breaks on all of his timber land which totals 7,000 acres and to date has reported no fires. Mr. Newsome is a turpentine man and where he has fire-breaks built he is able to work the trees without raking them. He says the fire-breaks can be constructed cheaper than he can rake the trees. It costs from 30 to 35 cents an acre to rake trees that are to be worked for turpentine. One can get fire protection through organized effort and the average cost will be 4 cents per acre.

SEVENTH DISTRICT
C. Bernard Beale, District Forester
Waycross

Catches Woods-Burner

After a long period of woods burning on the protected lands of the Brunswick Peninsula Company in southern Ware county, the vigilant efforts of patrolmen have at last been rewarded. Joe Pittman, prominent cattleman of the region, was caught in the act of firing the Peninsula Company's woods and was given chase by Will Cox, patrolman. Pittman escaped to a nearby bay but a warrant for his arrest was sworn out and he later surrendered.

Cattlemen in the Okefenokee section have been granted small areas for their "calf burns" with the understanding that they will not set out other fires. Most of the cattlemen have given splendid cooperation in the reforestation efforts of the Brunswick Company.

The patrol force on this property has been recently increased, and an intensive effort will be directed toward apprehending woods burners. Warning has been given that all cases of firing the woods will be prosecuted to the fullest extent of the law.

Wayne T. P. O. President Convinces Others.

No more enthusiastic timberman is to be found than A. E. Knight, druggist at Jesup and president of the Wayne County Timber Protective Organization. In addition

to running two drug stores, Mr. Knight also operates a turpentine place having 5,000 acres under fire protection. He has had fire breaks ploughed all through his property and reports a splendid growth of slash pine coming on.

Besides protecting his own property, Mr. Knight has worked untiringly to convince others of the need for fire protection.

Dixon Works to Organize T. P. O. In Pierce County.

Through the generous effort of L. H. Dixon, Pierce County farmer, almost 2,000 acres have been signed up by farmers in one section of Pierce county. Mr. Dixon has given a great deal of time to visiting farmers, explaining the timber protective organization plan, and inducing them to sign up their lands for fire protection. It is his intention to work in all sections of the county until sufficient acreage is subscribed to form a timber protective organization.

Decides Light Burning Won't Do

Riding along the road south of Argyle in Clinch county, the District Forester observed a patch of slash pine saplings severely burned. On inquiry of a farmer ploughing in a field on the opposite side of the road, the farmer explained as follows: "Well, you know I've worked at turpentine for ten years and the turpentine men always burned through lightly each year to keep down the rough. I came out here one evening and started a fire thinking I'd let it burn back through the saplings as I was afraid of the rough. But I've about made up my mind not to try to burn again. When you get a rough under saplings you just can't burn without killing lots of them. No, I don't think I'll ever try to burn any again".

Farmers in Brantley Believe in Fighting Fire

At a recent fire on Brantley County Timber Protective Organization lands, over 25 farmers responded to help fight the blaze, it is reported by County Agent L. V. Cawley. This is indicative of the splendid spirit in which Brantley county citizens are cooperating with each other in keeping down fires. They realize that it is only by such quick, unified action that fires can be controlled and the damage kept at a minimum. Due to their prompt action only 125 acres were burned over, and this could have been further reduced had there not been a fault in one of the fire breaks where the fire crossed over. This fire could easily have burned over a thousand acres had the area concerned not been protected by fire breaks and under organized protection.

The fire started through carelessness, crossing over from a field where stubble was being burned off. There have been few incendiary fires on the Brantley T. P. O. area this year.

GEORGIA APPALACHIAN TRAIL

Down the backbone of eastern North America from Mt. Katahdin in the state of Maine to Mt. Oglethorpe in Georgia runs the Appalachian Trail. It crosses the Catskills, dips into the famous Shenandoah Valley, runs the crest of the Unakas and mighty "Smokies" and enters Georgia following the crest of the Blue Ridge along one of the most picturesque sections of the two thousand miles of trail.

Advancing civilization has driven back the wilderness of eastern North America into that land "way up yonder" on the crest of the Appalachians. Here the trail follows magnificent heights. During the summer it threads through the verdant aisles of the primeval forest, is gorgeously tinted by the frosts of autumn, and is snow covered on its northern part sometimes for months of the year. It is trodden by the "big cat", experiences the padded footfall of the fox, and tread of the deer.

On November 1, 1930, an organization, known as the Georgia Appalachian Trail Club, was formed. A group of men and women from all walks of life but with the common interest in the preservation of Georgia's vanishing wilderness met and pledged themselves to promote public enjoyment of the trail. Visits to interesting spots along the trail of the Georgia highlands were planned for 1931.

The club motto is very appropriate: "Ours is a friendship for the trails that lead to far away places". C. N. Elliott.



Hiking The Trail

"The farmers and other land owners in the Columbus forestry district are fortunate in having headquarters of a branch of the Georgia Forest Service in Columbus The headquarters should be a helpful agency in improving the forests in this district and in developing a source of considerable potential wealth."—From an editorial of the Columbus Enquirer-Sun.

GEORGIA FOREST LOOKOUT

Volume 1

ATLANTA, GA., MAY, 1931

Number 5

FORESTRY ASSOCIATION ALBANY, MAY 20, 21

Public Invited to Meeting to Hear Notable Speakers on Practical Subjects—School Day 21st with Special Program—Field Demonstrations in Afternoon of 21st.

The tenth annual meeting of the Georgia Forestry Association to be held at Albany, May 20 and 21, should be attended by every person in Georgia interested in forestry. An interesting program of speeches by noted authorities is to be rendered. From the time the session is opened by President T. G. Woolford until the field demonstrations close the program, every moment will be interesting and profitable to those who attend.

A key note will be sounded by Hon. W. T. Anderson, Macon, in his address "What Forestry Means to Georgia". Do not miss the opening address.

"Progress and Plans in State Forestry" is a subject to be presented by State Forester B. M. Lufburrow.

"Research in Forestry" is a subject to be handled by United States Forestry Research workers in the South, E. L. Demmon, New Orleans, and Dr. C. R. Hursh, Asheville.

"A Railroad's Experience in Fire Protection" is the subject of Mr. Roland Turner of the Southern Railway, Atlanta.

H. L. Kayton, Savannah, will preside in the afternoon and Judge Ogden Persons, Forsyth, will be heard on "Law Enforcement in Fire Protection", followed by Dr. Eloise Gerry, United States Forest Service, Madison, Wisconsin, on "Tiny, Living Cells Today Build Multi-Product Pines".

S. R. Young of the Atlanta and West Point Railway speaks on "Timber and Railroads", followed by Joseph Kircher, United States Forest Service, Washington, on "The National Forests of Georgia."

(Continued on page 2, column 2)

GROWTH RATE OF PINES STUDIED

Actual Yields Far Short of What Can Be Obtained With Fire Prevention and Thinning.

Average stands of yellow pine subjected to annual or occasional fires and given no thinning can not be expected to grow more than one third to half a cord a year. Many acres are producing less because fires have prevented the development of a fair stand. On the other hand the southern pines allowed to come in to a good stand, or planted to a good stand, and then protected from

(Continued on page 2, column 3)



H. L. Kayton, Savannah, Pioneer in Georgia Forestry. Naval Stores Leader, Executive of Georgia Forestry Association.

STUDENT'S COMPETE FOR CAMP SCHOLARSHIP

State-Wide Forestry Examinations Held on April 20—Keen Interest and Close Competition Manifested—Camp July 27-August 15.

On April 20 examinations were held in every county in the state having vocational agricultural schools, to decide which boy in each county would get a scholarship that pays all expenses at the vocational forestry camp to be held at Young Harris College July 27 to August 15.

Great interest has been shown by the students of these schools and intensive study was given in preparation for the examination. Three students were selected from each of the schools to enter the contest.

Other vocational students than those who won scholarships can attend the camp by paying their own way or by using funds raised locally. Some local civic organizations are offering to finance scholarships, so that more students than one from each county having Smith-Hughes schools will be able to attend.

As soon as the examination papers are graded, the winners will be notified. A number of requests have been received, seeking to have boys attend camp who are interested in forestry but are not students of vocational schools. These requests have been denied because of lack of preparation in the study of forestry and in experience in practice of forest management received in handling a school forest.

To give the readers an idea of the character of work the rural school boys are doing, the list of questions submitted in the examination is given herewith:

1. How many acres of forest land in the state and what percentage of the state's area do they represent?
2. How many species of trees are found in Georgia?

(Continued on page 2, column 1)

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Students Compete—Cont'd

3. Name four important species of pine in the state and tell where each species is found in greatest abundance.
4. What species of pine are used for obtaining naval stores products and where are these species located?
5. Give reasons why forest lands should not be burned over.
6. What are firebreaks? Tell how they are constructed.
7. What is a fire tower and how is it used in fire protection?
8. What are the Georgia Timber Protective Organizations? How are they formed and how do they operate to control fires?
9. Name kinds of trees that are durable in contact with the soil and are therefore well suited to making fence posts?
10. What treatment is given to make posts, crossties and poles more durable, and why does the treatment prolong the life of the wood?
11. What is veneer and from what species of trees is it made?
12. What trees should be removed in improving a forest?
13. At what age should pines be planted, and how far apart should the rows and the plants in the rows be?
14. Tell how to remove seedlings from seed beds, what care should be taken and how they should be set out.
15. How can the age of a tree be known?
16. What is D. B. H.?
17. Give dimensions of a standard cord of wood, and give the length of a standard log.
18. Name some of the products made from cellulose of wood.
19. What kind of wood are used in making bats and handles? What very hard woods are used for making shuttles, bobbins, golfstick heads, etc? What kinds are suited for crossties? What kinds are used for furniture?
20. When is the best time to thin woods? Why?

Forestry Assn—Cont'd

Harris and Herty, Banquet Speakers

At night a banquet will be held at which Mr. Gordon E. Reynolds, Albany, will be toastmaster, and Dr. Charles H. Herty, New York, and Senator William J. Harris will be heard.

The morning session of the second day will be presided over by Captain I. F. El-dredge, Fargo, with Miss Emily Woodward, Vienna, as first speaker on the subject "Forestry as I See It", followed by Mr. George M. Rommel, Savannah, and Mr. J. A. Davis, Albany, on "Forest Taxation".

"Reaching the Man Who Owns the Forest" is the subject to be handled by Dr. Austin Cary, United States Forest Service, Starke, Florida. Mr. Paul Chapman, Athens, Director of Agricultural Vocational Board of Georgia, will be heard on "Forestry Education in the Schools", who will be followed by Professor G. D. Marckworth, new head of the Division of Forestry of the College of Agriculture at Athens, his subject being "Training Foresters for Georgia".

School Program

A program for high school pupils of Dougherty county and vocational schools of counties in southwest Georgia will be held in the auditorium in the morning. Music by an Albany glee club, short talks and the moving picture, "Partners", will make up the program. Admission is free.

Field Demonstrations

In a forest area near Albany, field demonstrations will be conducted in the afternoon, in firebreak construction, power felling of trees, fireproof and aluminum coated wood.

H. L. Kayton, Pioneer Forestry Leader

H. L. Kayton, president Carson Naval Stores Company, Savannah, has contributed much to the success of the forestry movement of Georgia from the time the Georgia Forestry Association was formed ten years ago. He helped to establish the Georgia Forest Service and his counsel in all matters pertaining to development of forestry in relation to naval stores has been invaluable.

Rising from the position of office boy to the presidency of one of the greatest naval stores companies of the country is a great distinction, and the same qualities which brought him to the front in his own company has carried him high among leaders of the whole naval stores industry of the south. No man in the industry is more highly respected and admired.

Mr. Kayton's interests in forestry are broad and sympathetic to all industries looking to the forests for raw material. He is working for the fullest possible development of all forest resources. His sound contributions to policies and programs of forestry development in Georgia have been highly valued by leaders in this field.

It is with pleasure that Mr. Kayton's likeness is entered in the gallery of the

Georgia Forest Lookout as among the notables in forestry promotion in Georgia.

Pines Studied

(Continued from page 1, column 2)

fire and given reasonable thinning, will produce from one to 1 1-2 cords per acre annually under average conditions.

These statements are made for all pines and for general conditions. Growth will vary with the species of pines and soil conditions. The slash and loblolly grow fastest; longleaf and shortleaf a little slower. The growth rate of slash is fastest during the first few years but is overtaken by loblolly in 20 or 25 years and later by shortleaf and before complete maturity both longleaf and shortleaf surpass slash according to the best information.

Slash and pond pine do best on low moist lands, while longleaf, loblolly, shortleaf and scrub pines do best on the higher lands. All, of course, make their greatest growth on richer soils. But a very desirable feature about pines in general is that they will make greater growth on poor lands than any other commercial species of trees. They, above all else, are the trees for abandoned and eroded farm lands.

Some studies on growth of pines in Appling county, Georgia, have recently been reported by the United States Department of Agriculture, these studies having been made by R. D. Forbes of the Southern Forest Experiment Station and Donald Bruce of the United States Forest Service.

Second growth loblolly under conditions existing in that county produce per year a normal yield with fully stocked stand on the poorest site 8 cords per acre in 15 years, the annual yield increasing as the trees grow older with a maximum at 40 years of age when it is .88 cord per year.

On the best site the normal yield of loblolly is much greater. In 15 years the yield is 30 cords per acre or 2 cords growth each year. The rate of annual increase reaches its height at the age of 35 years when it is 2.37 cords per year.

On the poorest site longleaf pine did not begin to produce wood 4 inches in diameter until 15 years of age and reached a maximum annual growth increment at 40 years when there was only .22 of a cord a year. But on the best site an annual growth of 1.47 cords was obtained in 15 years and the maximum annual increment of growth was at 40 years of age when it was 1.82 cords.

Shortleaf pine produces under normal growth in 30 years on the poorest site, 13 cords per acre, with maximum annual increase of .98 cord at the age of 80 years. But on the best site 20 cords were grown in 15 years and a maximum rate of increase was attained at the age of 35 years when it was 2.06 cords per year.

Slash Pine on the poorest site produced normally 12 cords in 15 years, the rate

of growth increasing to a maximum of 1.07 cords per year, 30 years of age. On the best site, however, the normal yield 37 cords in 15 years with the rate of increase reaching a maximum of 2.47 cords annually at the age of 15 years. The slash pine is, therefore, the most rapid producer of wood in the first 15 years of growth.

It would doubtless be interesting to compare the yield on the best sites for each of the species for the 30 year period of growth. The results are as follows: Loblolly 70 cords; longleaf 54 cords; short leaf 60 cords; slash 59 cords. The average diameters of each of these species at the age of 30 years are as follows: Loblolly 10.4 inches; longleaf 8.1 inches; shortleaf 9.5 inches; slash 9.2 inches.

It will be seen from this data that the loblolly takes the lead as a grower wood at the age of 30 years followed by shortleaf, slash and longleaf in turn.

At the age of 50 years the average diameters for each species on the best site is: Loblolly 15.1 inches; longleaf 11.4; shortleaf 13.6; slash 13.1. The growth rate at 50 years is in the same order as at 30 years. The same order exist at 80 years of age, but slash matures in about 60 years while longleaf does not cease growing for at least 100 years and shortleaf and loblolly grow for perhaps not more than 80 years.

While loblolly and shortleaf are the greatest producers of wood in the long run, slash and longleaf are the most valuable because of their production of gum for naval stores. These two species are best suited to the coastal plain. While loblolly grows to some extent in the coastal plain, it predominates in the piedmont region. Shortleaf is most abundant in the upper piedmont and foot hills of the mountains.

The scrub pine, so called, is not a scrub in fact, though it does not attain the size of other pines mentioned. It is the pine that predominates in the mountains. No data are available on its rate of growth. The pond pine is a south Georgia pine, that is not abundant enough to be of commercial importance. No growth studies have been made of it.

The growth rates given are those of natural forest conditions. Can the growth rate be increased?

Old fields planted to pines have shown more rapid rate of growth than trees under natural reforestation. This is to be expected because there is not so much competition. Sapling pines growing through natural reforestation as thickets, can also be increased in growth by proper thinning.

While there are very little data on which to base a decision, it seems reasonable to conclude that southern pines, properly managed and protected from fire can be brought to yield an average of 1 1-2 to 2 cords per acre yearly on fair to good land with full stand.

FIRST DISTRICT W. D. Young, District Forester Rome

Berry Schools Grow Seedlings

Berry Schools, near Rome, have recently planted enough pine seed to produce 25,000 seedlings for the next planting season.

This program of planting will be carried out from year to year until all open lands which will not restock within a reasonable time, are planted.

Fite Offers Rewards

Mr. Clifford D. Fite, one of the members of the Polk County T. P. O., believes in the future of timber and the value of protecting it by offering a reward. A poster he has placed in a number of places is as follows:

"REWARD

"Reward of \$50.00

"Will be paid for arrest, with evidence to convict, of any person firing these woods, in violation of law.

"CLIFFORD D. FITE"

Other timber owners over the State may realize better protection of their lands by following the example set by Mr. Fite.

FOURTH DISTRICT W. G. Wallace, District Forester Columbus, Ga.

New School Forest

A new school forest has recently been established at Hogansville High School in Troup county with twenty-eight boys enrolled in the study of forestry. This school is fortunate in having one so interested and capable as Mr. W. G. Johnston for its vocational teacher. The school forest is composed of about fifteen acres of pine forests easily viewed from the highway and well suited to forest management and experimentation. The boys are interested, and much is expected from them in the future.

T.P.O. Formed at Warm Springs

The Meriwether County Timber Protective Organization near Warm Springs is functioning one hundred percent. This organization is well equipped with fire fighting tools and equipment and has a seventy-five foot steel tower on Pine mountain for detecting fires. This organization has been troubled with many fires but comparatively few acres have burned over due to efficiency in detecting, getting to, and suppressing fires. About 15,000 acres are under protection.

The lookout tower on Pine mountain has been a source of intense interest to several hundred visitors within the past few months. A powerful telescope was recently installed for detecting fires and for observation by visitors.

Fire Prevention in the Ft. Benning Forests

The Fort Benning Military Reservation in Chattahoochee county contains 100,000 acres of land, presenting a problem in forest protection. The system of forest fire detection consists of a combination lookout-patrol system in each of the divisions into which the tract is divided. All information concerning fires is phoned to garrison headquarters where one hundred and fifty men are reserved during the fire season for suppressing fires. Equipped trucks are maintained to despatch men to the fires.

Capt. W. B. Tuttle who is in charge of all forestry activities at Fort Benning states that several of his large fires have originated on private lands bordering the reservation. The Georgia Forest Service is endeavoring to organize a Timber Protective Organization in Chattahoochee county, and if such an organization can be formed it is believed that both the T. P. O. and the Fort Benning organization will be of immense help to each other. It is interesting to note that in some sections near the Fort Benning Reservation there have been practically no forest fires at all due to the example set by the military reservation.

Meriwether T. P. O. After Fire Bugs

The first outbreak of forest fire on the new Timber Protective Organization in Meriwether county responded to a fire alarm of towerman Walter Holms and under the direction of Fire Captain Duncan Leverett and President A. S. Persons, a fire driven by a stiff wind was under control when about 75 acres had been burned.

The Timber Protective Organization offers a reward of \$25, supplemented by another offer of \$25 by the county, for proof as to the persons starting the fire.

STATE FORESTERS TO MEET IN GEORGIA

The National Association of State Foresters will be the joint guests of the state foresters of Georgia and Florida this fall at a date to be announced later. General outlines of the conference were arranged by State Forester Harry Lee Baker of Florida and State Forester B. M. Lufburrow, during the recent meeting of the Florida Commercial Forestry Conference held at Marianna, Florida.

Two of the three days of the conference will be held in Georgia where trips will be made to acquaint the visitors with forest practices in this state, and one day will be spent in North Florida.

Representatives of state forestry departments from all parts of the United States will attend the meeting.

SIXTH DISTRICT

**Jack Thurmond, District Forester
Savannah**

Ludowici School Forest Established

On March 20th a survey was made of twelve acres of land near Ludowici which is supporting a growth of young and cut-over timber. This tract will be used by the vocational school boys in the practice of forestry. They will conduct planting, protection, thinning, and growth study demonstrations on this area for a period of ten years and attempt to show the people of the community just what can be expected of an area that is under proper management. In addition to the work outlined for the boys to do in the management plans as prepared by the Georgia Forest Service, they have already perfected plans for building a log cabin and club house on their school forest.

Woods Burner Lands in Jail

Mr. Jim L. Gillis, member and vice president of the Treutlen County Timber Protective Organization, caught a negro putting fire in his woods that he is protecting and had him arrested and lodged in the county jail. The negro remained in custody for a week and was finally released on \$500.00 bond. Arrests for violating the woods burning law are getting rather common, it seems.

Woods Burner Arrested in Liberty County

While making his regular patrol rounds of the land in the Liberty County T. P. O. on March 11th, Mr. W. I. Stafford, secretary-treasurer, patrolman and member of this organization which contains some 20,000 acres, arrested two negroes who had allowed fire to get out of turpentine woods in which they were working and on to the protected land. They were taken into custody and later released on \$200.00 bonds each. This is the first arrest for woods burning by the organization since it came into being last September.

As further protective measures against wilful and malicious burning on the land listed in the Liberty county T. P. O., Mr. Stafford has been authorized by the organization to obtain bloodhounds to apprehend violators of the woods burning law and to also obtain several dozen metal signs to be posted over the protected land calling the public's attention to the fact and warning them to be careful with fire.

The Liberty County Timber Protective Organization is growing, it is putting into practice the best protective policies as outlined by the Georgia Forest Service and is getting results.

Gillis Plants Successfully

On 300 acres planted in February and the first few days in March, in Slash Pine on abandoned farm land spaced 10 x 10 feet, 90 to 98 percent of them lived. The plants were grown around bay heads and creeks on Mr. Gillis' own land and were planted after he had thrown two furrows together leaving a slight hollow in which to place the seedlings. The furrows act as a water furrow to conserve the moisture and give the seedlings a chance to grow off before the weeds get a good start. The furrows also give protection against small grass fire.

Florida Holds Forestry Conference

The Florida Department of Forestry, in cooperation with the United States Chamber of Commerce, held a commercial forestry conference at Marianna in early April similar to that held at Savannah in Georgia last year. The state's forestry leaders attended.

One of the features of the conference was a visit to the new paper mill of the International Paper Company located at Panama City. Among Georgians to attend were William Candler, W. G. Hastings, Jr., and State Forester B. M. Luffburrow, Atlanta, and Captain I. F. Eldredge, of Fargo.

A session of the Southeastern Section of the American Society of Foresters was held during the meeting.

Legislature Commended

"The Georgia Legislature has shown gratifying interest in forestry of late years, and it is confidently anticipated that the incoming Legislature will interest itself in this problem and seek to advance it as no administration of the past has done. The entire problem is much on the mind and conscience of the incoming governor."—From an editorial in the Atlanta Georgian.

Improvements at Indian Springs Forest Park

The causeway connecting the entrance of the Indian Spring Park with the famous spring has been completed and is now open to the public. This causeway over Sandy Creek and the low ground along its course is constructed of concrete on piling and replaces a wooden structure which has long been in need of replacing. The new structure is very attractive in appearance as well as substantial in construction.

Considerable planting of native trees and shrubs in the park has also been done this spring and further improvement projects are in progress. The Georgia Forest Service is preparing a plan which will provide for the systematic development of the area with the assistance of the citizens committee with whom it is cooperating. A number of important improvements will be made during the next few months.

E. B. Stone, Jr.

Forest Management for Naval Stores

A bulletin entitled "Forest Management for Naval Stores" has been issued by the Georgia Forest Service. H. M. Sebring, assistant state forester, directing the work in South Georgia, is the author.

Not only does the bulletin deal with managing pines for naval stores but for other forest products including lumber, poles, etc. Valuable data obtained by federal research workers as well as by the Georgia Forest Service are drawn upon in developing the management plans recommended.

This bulletin should be of special interest to South Georgia where the gum producing pines grow.

Mountain Arboretum

The Georgia Experiment Station is starting an arboretum at its mountain branch in Union county with the purpose of having every kind of arborescent vegetation native to the mountains on the station grounds. The Station is already co-operating with the Appalachian Forestry Experiment Station of the United States Forest Service in research work on a typical mountain forest found on the station farm.

The arboretum is being established under the direction of Bonnell H. Stone, consulting forester at Blairsville, whose many years of experience as forester in the mountains eminently fit him for the work. This is the first forest arboretum to be started in Georgia.

American Forestry Association Annual Meeting

The annual meeting of the American Forestry Association will be held June 3, 4 and 5, at Asheville, North Carolina, with Kenilworth Inn as headquarters. A program of prominent speakers and trips to interesting points in the mountains are to be enjoyed.

Appalachian Trail Meet

The fifth annual meeting at the Appalachian Trail Association will be held June 12-14 at Gatlinburg, Tennessee, in the Great Smoky Mountain National Park with the Great Smoky Mountain Hiking Club of Knoxville, as host. Among the features of the meeting will be hikes and auto trips in the park.

The Georgia division of the trail will be represented by several delegates.

Pulp and Paper Making

The Florida Forest Service has recently issued a bulletin entitled "Possibilities of Pulp and Paper Making in Florida", by Harry Lee Baker, state forester, and William L. Wilson, special investigator, utilization of forest products.

GEORGIA FOREST LOOKOUT

Volume 1

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Number 6

FRENCH SYSTEM OF TURPENTINING INTRODUCED

First Commercial Trial on Brunswick Peninsula Company Lands—Dif- ference of French and American Methods Explained.

Four crops of turpentine timber, worked according to the French system of turpenting, have been recently installed by Col. R. E. Benedict, forester, on several tracts of the Brunswick Peninsula Company lands in Glynn and Ware counties.

The entire operation of chipping the trees and dipping the gum will be handled by one man for each crop. The crop will consist of about 6,000 cups each. Each turpentine farmer will live near the tract of timber to be worked, and in addition to farming the timber, will have a vegetable garden and a small feed crop in connection with raising livestock for which purpose each farm will be eventually fenced.

The French system employs a very narrow face or wound on the trees, being only 3 1-2 inches in width. The chipping is done with a tool resembling the old-fashioned "hogow". Chief distinctions between the ordinary American face and the French face are: A French face is 2 to 4 inches wide; an American, 6 to 14 inches in width. The French face is arched at the top; the American face has a V-shaped peak. The amount of wood surface freshened every week by chipping is 5 to 7 inches long and 4 inches wide, whereas the American face only has a freshened surface after chipping of 8 or 10 inches and only 1-2 inch wide. Only a thin shaving of wood, often less than 1-4 inch thick is taken off in chipping a French face, whereas a stout chip of wood, often 1-2 by 3-4 inches is removed in American chipping.

Col. Benedict believes that with the French system much of the old back-boxed timber can be salvaged profitably that

(Continued on page 2, column 3)

J. LEONARD ROUNTREE Forestry Leader

One of the pioneers in forestry in Georgia is J. Leonard Rountree, Summit, Georgia. It was he who, as a member of the State Legislature, introduced the bill that created the state's department of forestry. From the first, he has been a member of the Georgia State Board of Forestry, which board directs the Georgia Forest Service.

Mr. Rountree is a large land owner, a sawmill and turpentine operator and a large farmer. Previous to introducing the bill that created the department of forestry, as a legislator he had sought to enact laws regulating the size of trees to be turpented and had been aggressive in promoting the timber and naval stores interests of the state.

Mr. Rountree has given consideration to the problem of forest taxation and is among those who believe that tax on forest lands must be revised to promote timber growing in Georgia.

In view of his interest in forestry and his continuous activity in this field, it is with pleasure that his likeness is added to the gallery of pioneers in Georgia forestry which has been displayed in the Georgia Forest Lookout.



J. LEONARD ROUNTREE

WINNERS OF SUMMER CAMP SCHOLARSHIPS ANNOUNCED

Interest Was Keen and Many Excel- lent Examination Papers Were Sub- mitted—Camp July 27-Aug. 15.

A contest for scholarships in a forestry summer camp at Young Harris College July 27—August 15, has been concluded in nearly one hundred rural consolidated high schools of the state.

The examination questions were prepared by the Georgia Forest Service and the papers submitted by students have been graded by representatives of that organization who express themselves as being well pleased with the results.

One scholarship is given to a student in each county having a vocational agricultural school and school forest. Other students of these schools who have made good grades in the test are entitled to attend the camp by paying their own expenses.

The three weeks' camp is in general charge of the Department of Vocational Agriculture of the State, with the Georgia Forest Service conducting the forestry work. Students who attend camp will be taught tree identification, timber cruising, forest management and uses of woods, much of the work to be done in the forest. Excursions are to be made to paper mills, rayon plant, tannic acid plant, logging operations, saw mills and also to the Great Smoky Mountain National Park.

The four highest grades made by students are, in their order: Marvin Lloyd, Chamblee High School, DeKalb county; Horace Ayres, 4th District A. and M. School, Carrollton, Carroll county; Fulton Morey, Sale City High School, Mitchell county; Ezra Taylor, Vidalia High School, Toombs county.

The three schools averaging the highest grades are Chamblee High School, Chamblee; Center Consolidated School, Vidalia; 4th District A. and M. School, Carrollton.

GEORGIA FOREST LOOKOUT

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The three counties having highest grades in their order are: Dawson, Toombs and Stephens.

The winning students are as follows:

Banks county—William Chambers, Bank County High School.

Barrow county—James Harrison, Windsor High School.

Berrien county—Lester Golden, Nashville.

Bibb county—Joe Johnston, Lanier High for Boys, Macon.

Bleckley county—George Norris, Middle Ga. Jr. College, Cochran.

Bulloch county—Robert C. Hall, Brooklet High School.

Burke county—J. R. Stafford, Jr., Girard High School.

Campbell county—Charles Harper, Fairburn High School.

Carroll county—Horace Ayres, 4th District A. & M. School, Carrollton.

Chattooga county—Frank Hendrix, Gore High School.

Cherokee county—Fred Harris, Reinhardt College, Waleska.

Cobb county—Ernest Howard, 7th District A & M School, Powder Springs.

Colquitt county—Ralph Watson, Moultrie High School.

Cook county—J. J. Taylor, Jr., Sparks-Adel High School, Sparks.

Clarke county—Dorsey Martin, Winter-ville High School.

Dawson county—Merlin Burt, Dawsonville High School.

DeKalb county—Marvin Lloyd, Cham-blee High School.

Emmanuel county—Robert C. Harford, Adrian High School.

Elbert county—Harry O. Symons, Bowman High School.

Fannin county—Gerald C. Eppworth, Seminary.

Forsyth county—Claud Harris, Cum-ning High School.

Franklin county—Bill Sanders, Frank-lin County High School.

Gordon county—Ansul Meador, Sonora-ville High School.

Gwinnett county—Robert Miller, Snell-ville High School.

Habersham county—H. J. McCurry, Hol-lywood High School.

Hancock county—Bill Wallace, 10th District A & M, Granite Hill.

Hart county—Clayton Cordell, Nancy Hart Consolidated School, Hartwell.

Heard county—Sidney Jackson, Central-hatchee Consolidated School, Franklin.

Jackson county—Howard Carlan, Com-merce High School.

Jefferson county—Glen Rhodes, Staple-ton High School.

Johnson county—Buren Claxton, Kite Consolidated School.

Lamar county—Arthur Steedly, Georgia Industrial College, Barnesville.

Lanier county—Wesley Moore, Crisp Consolidated School, Stockton.

Laurens county—Herman Gilder, Rentz High School.

Madison county—Clarence Carson, Madison County High School, Danielsville.

Meriwether county—Abner Lynch, Woodbury High School.

Mitchell county—Fulton Morey, Sale City High School.

Morgan county—Alvin DeLoach, 8th District A. & M. School, Madison.

Newton county—J. C. Ellington, Palm-er-Stone Consolidated School, Oxford.

Stephens county—Weldon Spearman, Eastanollee High School.

Stewart county—Ben Shirling, Lump-kin High School.

Sumter county—C. W. Grant, Union High School.

Taylor county—L. B. Locke, Butler High School.

Terrell county—Howard Adams, Graves High School.

Thomas county—Clarence Edmondson, Pavo High School.

Tift county—J. C. Webb, Jr., Omega High School.

Toombs county—Ezra Taylor, Vidalia High School.

Treutlen county—Jim L. Gillis, Jr., So-portion High School.

Troup county—William Johnson, Ho-gansville High School.

Walton county—Broadus Orr, Ga. Voca-tional & Trades School, Monroe.

Ware county—Bill Seaman, Waresboro High School.

Wayne county—Julian Rayne, Screven High School.

Whitfield county—Joe Hair, Dawnville High School.

Wilkes county—George Garrard, Wash-ington High School.

Webster county—Edmund Dillard, Union Consolidated School.

Worth county—Herman Tyson, Sumner Consolidated School.

FRENCH METHOD

(Continued from page 1, col. 1)

would not support an American face, and that the shallow nature of the face will promote rapid healing.

It is his opinion also that by a distribution of the woods-workers over the forest, the system of forest organization one finds in France, instead of housing them in centralized turpentine camps, or quarters, prompt control over fires will be afforded, and better workman-ship will result.

Although experiments conducted by the government at Starke, Florida, show that, for the same amount of surface wounded, 22 percent more gum is obtained from French faces than from American, it is essential that higher grades of rosin be obtained than the average American grades, in order to offset the fact that French faces are only one-half the width of American faces, and the condition of most of the old timber will only permit one French face per tree. Every means known will be employed to hold up a high quality of gum on the crops put up by the use of clay cups and covering the cups with paddles at the time of chip-ping to keep out trash and bark.

This is the first test ever conducted with French faces on a commercial scale of production. If the results are satisfactory, it is possible that other operators will be induced to replace the present American system with the French. If it is found to be economically successful, the fact that the French system of working the timber and forest organization makes possible a more intensive fire control and silvicultural practice than is now financially possible with the American system may bring about a general adoption of the French system of turpentine operation.

C. Bernard Beale

See Georgia Mountains In Summer Beauty

Many beautiful flowering plants and flowers are to be found in the mountains of North Georgia at this time of the year. The dogwood and the numerous varieties of azalea have already made their appearance, and the mountain ivy is beginning to blossom forth. The rhododendron is still dormant but should be in blossom sometime in June. In addition to these larger plants there is an almost unending variety of wild flowers to be found on almost every side extending from the shaded nooks along the streams to the tops of the most wooded ridges.

The mountains of North Georgia are taking on color which is in marked contrast to the drab appearance of a few weeks ago. A trip to one of the many points of interest in the mountains will furnish much of interest to the pleasure seeker and the gorgeous color schemes presented can only be rivaled by the wonderful coloring of the foliage in the fall.

E. B. Stone, Jr.

SOME CURIOUS ANSWERS TO EXAMINATION QUESTIONS

Taken from Papers Submitted by Students Seeking Scholarships at Forest Camp.

You should burn off the forest to keep fire out.

Short-needle and Branch pine is found in South Georgia, White Pines is found in middle of Georgia, Lobby pine is found in different parts.

A fire tower is a scaffold to look for fires so they can be distinguished.

If rangers cannot put out fires they go get the fire department.

A hybrid is a place to get water.

The best time to thin is in the winter when all the trees is dead.

Fire in the woods destroys fish.

A fire break is something made by mules.

A fire break is a place that looks like this. (illustration)

Georgia Timber Protective Associations elect a president, a vice-president and a secretary and treasurer to fight fires.

To make trees more durable, put them in a self made boiler and pour tree soup on them.

Trees to be thinned out of the forest is submerged trees, depressed trees and skinny trees.

The age of a tree is known by the ligaments in a tree.

D. B. H. is a kind of disease that injures pine trees.

Some of the products made from cellulose of wood is camel cigarettes, candy, cigars and cakes.

The trees that should be removed in improving a forest is left out.

The above is not typical but merely a few "slips". As a whole the examination papers were good and doubtless ranked well with examinations in other school subjects.

C. N. Elliott

Students Plant Highway

The Vocational Forestry Club at Palmers-Stone consolidated school in Newton County put out 1000 slash pine seedlings on the school forest and other areas selected for the demonstration. Some of these seedlings were planted in Cecil clay loam soil on barren hillsides and some in wet bottomlands to test the conditions under which this species can best thrive out of its natural habitat.

In addition, the forestry club planted ten miles of loblolly pine and dogwood in the highway beautification program between Atlanta and Augusta.

SIXTH DISTRICT Jack Thurmond, District Forester Savannah

Educational Work in Liberty County

Mr. W. I. Stafford, Sec.-Treas. and Patron of the Liberty County T. P. O., says that Liberty County T. P. O. has some real educational work to put over before a strong sentiment is created in favor of rough woods and timber growing. The people want the timber and admit that it is through the sale of timber or its by-products that most of our money enters the county, still they are not willing to make the sacrifice nor put forth the effort required to let it grow.

Some of the cattle owners, but not all of them, firmly believe that they will have to stop raising cattle if they stop burning the woods. A prominent lawyer in Hinesville said to the writer: "You know we will have to burn off the woods so the old cows will have grass to eat." In reply I said that in my regular patrol work for the Liberty county T. P. O. all the dead and starving cattle were found on or around burns. However some of our old cattlemen are in favor of rough woods and express the hope that we will be able to keep it rough long enough to convince the public of the real truth.

Some of the landowners argue that if woods are kept rough for 4 or 5 years and fire does get in it in a dry, windy time the loss will be greater than if they are burned every year. Personally, I know of lands that have been burned over every year for the past 30 years and today there is not a sapling big enough to get a pine top from it to fight fire with, while on adjoining lands that have been kept rough for 5 or 6 years a good growth of slash pine from 7 to 10 feet high can be found.

This is our first year in cooperative forest fire protection work in Liberty county and it seems that we had more woods burning boosters than fire fighters. However the organization is more determined than ever to make timber growing both profitable and successful in Liberty county and intend to at least double the membership and acreage this second year. Of our protected land for the first year in protection work only 8 percent was burned over while unprotected land was 98 percent burned.

Rewards for Woods Burners Given

O. L. Williams of Egypt, Ga., Effingham county, has a standing reward of \$5.00 for information leading to the arrest and conviction of any person caught firing his woods. Mr. Williams is a leader in his community and an up to date business man, he is in for forest protection and is aiding the district forester in working up sentiment for a Timber Protective Organization in Effingham county.

Practices Thinning and Pruning

J. W. Key of Modoc, Georgia, Emanuel county, has done considerable thinning and pruning in his young timber to get it in better shape for intensive forest management so that he will realize a greater profit on the 300 acres that he has thinned. Mr. Key is a turpentine farmer and timberman, he is for forest protection as he is anxious to realize a greater profit from his timber and will do so if he continues to follow his present protective methods.

Emanuel County Timber Protective Organization Formed

A meeting was held at the county courthouse in Swainsboro on May 8 and the landowners who are anxious to keep fire out of their woods were present and formed an organization for forest fire protection which includes land owned by 5 men totaling 10,225 acres.

They plan to build fire-breaks on the land and post signs over the area calling the attention of the public to the fact that the land is under protection and what the results are expected to be.

Fire protection work is getting more popular in every section and there are several more Timber Protective Organizations in the process of completion in District 6.

SEVENTH DISTRICT E. Bernard Beale, District Forester Waycross

Colson and Peebles Good Fire-Fighters

What a fire truck well-equipped with good fire-fighting implements and two good men and ready to respond at a minute's notice, can do in controlling fires, is shown by the record of the Camden T. P. O. fire crew.

Fire Chief A. P. Colson and his assistant, Albert Peebles, responded to 25 fires during the first quarter. Sixteen of the fires were reached and extinguished within two hours after the fires were reported. A large number of the fires were 10 to 15 miles distant, often over very muddy roads. In some cases two fires were reported simultaneously and it was largely through their quick, efficient response that heavy losses were prevented.

Messrs. Colson and Peebles have done a splendid job in going after the fires on the Camden County T. P. O. area this year, and their efforts deserve the praise of all those who believe in keeping woods rough.

Ocilla to Have Arboretum

The Woman's Club at Ocilla plans to develop a tract of woodland deeded to the city as an arboretum. A survey of the plot discloses that there are now ten or more

species present, and it is the intention of the club to have a representation of each of the 163 tree species in Georgia that can be propagated in this climate. The area, which embraces two acres of woodland and 5 acres of cleared land, is being mapped and sites assigned for the planting of each species. Some of the trees will be furnished by the Georgia Forest Service, private donors, and possibly several species may be obtained from the Plant Introduction farm at Savannah.

T. P. O.'s Influence on Unorganized Farmers

Commenting on the fact that his students had very few fires to report, I. V. Chandler, teacher of vocational agriculture of Poplar Springs Consolidated School in Berrien county, says that it is due to the Timber Protective Organization of Henry Gaskins.

Noting how much better the forests were growing where protective measures are used, farmers stopped burning their timber lands. Only three fires occurred in the area covered by the school and only one of these was purposely burned by the owner.

Vogel Park Trails Open—Visitors Numerous

The trails constructed by the Georgia Forest Service in and adjacent to the Vogel State Forest Park have been thoroughly worked over and cleared of fallen trees and other debris which accumulated during the winter months.

New signs have also been posted throughout the trail system. These signs give clear directions as to the places of interest within the park.

The trail system includes 6 1-2 miles of trail, leading from Neel Gap to the summit of Blood Mountain, to DeSoto waterfalls and to Notalee waterfalls. There are two circuits included in the system so that it is not necessary to retrace one's steps.

The last few Sundays have seen large numbers of visitors at the forest park and it is expected that they will increase in number as the spring develops.

E. B. Stone, Jr.

"The Forestry Department has certainly made a valiant effort to bring to the attention of the people of Georgia the need for reforestation. The campaigns have been without the thrill that is usually attained or created at the time that a disinterested party is able to present to the owner of scrub land the bonanza that the raising of pine trees will prove for a period of years Georgia has a wonderful future before it in this regard, if it will continue as developed and planned. No crop will prove more productive in the future. Reforestation in this part of the country has been marvelously stimulated within the past five years." —Thomasville Times-Enterprise.

NOTES ON THE OKEFENOKEE

On a recent trip into the Okefenokee swamp I became interested in observing some of the features of plant life which crowd this 600,000 acres of wilderness.

The most impressive plant life is the enormous forests of cypress. We made our way through these in canoeing across the swamp by following narrow runs. These runs wind among the huge trees that made a veritable moss draped wall on either side. Any sound of the paddle, or spoken word, or other noise seemed to be muffled.

Throughout the swamp are a great number of fallen logs. They may be the beginning of a coal deposit, though our coal deposits were made of trees like the palm or yucca.

Few pines are found in the swamp proper. These grow on hammocks and one knows how to locate islands by the pines. Where an island is partially covered with water, the foliage of the pines is yellowed, but when the surface of the island is above water, the foliage of the pine is dark green.

Islands in the swamp have a great variety of plants. Huckleberries are perhaps the most common. These grow profusely over the entire upland and in some spots are so thick that pushing one's way through them is not easy. Bears forage here during huckleberry season but on account of the thick underbrush, they are hard to see. The cassena berry, red maple, box elder, live oak, spanish oak and water oaks may be found around the outskirts of the swamp. Tupelo gums vie with cypress in some spots for supremacy.

The naturalist never finds himself out of something interesting to see in this wilderness area.

C. N. Elliott.

Unexcelled Forest Resources

Warren T. White, general industrial agent of the Seaboard Air Line, in an article appearing in the Manufacturers Record, quotes Austin Cary, veteran of the United States Forest Service, to the effect that southern pines grow faster than any species of trees in the United States, and says: "In the southern pine belt the United States is thought to possess the greatest single asset in the way of potential source of coniferous wood and lumber that exists anywhere on the face of the earth".



Pine Tree Lookout Tower
Georgia Industrial College, Barnesville.



Forestry Cabin and Students Who Built It.
Georgia Industrial College, Barnesville.

Georgia Forestry Association Recommends Increased Appropriations and New Legislation

Important Gathering at Albany Attended by United States Senators, Congressmen, Timber Owners, Farmers, Foresters and Business Men—Program Replete With Interest—Exhibits, Field Demonstrations, School Meeting Among Features—Next Meeting at Rome.

The tenth annual meeting of the Georgia Forestry Association, held at Albany, May 20 and 21, was the most largely attended of all association meetings and by a high class of interested citizens, among them being two United States senators, congressmen, judges, business and professional men, besides timber owners.

Among the various subjects discussed, perhaps the most constructive suggestions were those dealing with taxation, fire law modification, forestry research, education and timber utilization including the use of southern pines for paper manufacture.

Of chief importance in actions taken by the association by resolutions was a request that the legislature enlarge its appropriations to the Georgia Forest Service so as to provide \$50,000 for research in the use of Georgia woods for paper manufacture and other cellulose products so that the state can increase its work and obtain its allotted federal funds. The legislature was also asked to pass an enabling act whereby the United States Forest Service may acquire 25,000 acres on which to establish naval stores research. A revision of tax laws whereby timber growing would receive greater encouragement was recommended.

The association pledged its support of the existing policy of employing none but scientifically trained men on the staff of the Georgia Forest Service and to help keep this service free from politics.

The association expressed itself as delighted with the hospitality of Albany and with the thoroughness of the local committee on arrangements. The delegates were entertained at two luncheons and a banquet. The whole two days' session was a feast of oratory and information.

Opening Session

After the invocation by Rev. Reese, Griffin, Mayor J. B. Billingslea cordially welcomed the visitors to a city with an international reputation for its fire department, a health center, the pecan capital, and a region of diversified farming.

Accepting the welcome cordially, President T. G. Woolford introduced W. T. Anderson, Editor of the Macon Telegraph, who gave the meeting a good start with trenchant and witty comment on the need of forestry in Georgia with the greatest

timber acreage of any state in the Union, covering two-thirds of its area. His explanation of a lack of greater progress in Georgia is the lack of self-consciousness of the state and a feeling of individual responsibility. With an appreciation of forest values the state, he said, would put an end to the acts of torch bearers who burn the woods and who have been burning fertility of forest soils, contributing to erosion losses, depleting the forest floor of the sponge that conserves water power and filling the rivers with muddy waters that drive out the best fish.

"Find better markets for forest products and the problem is solved," he said. "No one will burn what he can sell".

Given a chance, he said, the forests will revolutionize Georgia and bring it to great prosperity. Communities in Georgia are now growing more agricultural crops on 60 percent less acreage than was formerly grown, and at greater profit, leaving, he stated, land for which there is no other need than for growing trees.

Progress of Forestry in Georgia

B. M. Lufburrow, State Forester, whose subject was "Progress and Plans in State Forestry", portrayed briefly the progress by contrasting what existed five years ago with what now exists. In 1925 the Georgia Forest Service borrowed \$1,000 on which to start operations, now it administers \$163,000. At the beginning the personnel consisted of a state forester, now there has been added a staff of 9 foresters, two full-time clerks and seven part-time stenographers.

In 1925 no timber was under protection from fire. Now over 2,000,000 acres are under organized protection of 31 timber protective organizations, with 21 observation towers, 409 miles of telephone lines, 50 miles of fire trails, 3,000 miles of firebreaks, fire fighting equipment, 73 patrolmen and 21 towersmen. Education work was merely a plan at the beginning, now 14 bulletins, 11 leaflets, several thousand fire placards, hundreds of talks and many thousands of contacts are made with landowners. Newspapers are constantly supplied with acceptable news matter. Over 100 schools have been induced to establish school forests and carry on a forestry project and a forest camp for boys is being established in the mountains of North Georgia.

Georgia was first to establish a state forest fair. A state tree nursery is now in operation. Forest research is being carried on in cooperation with state and federal agencies. Two forest parks have been established. The press is giving splendid support.

The future plans call for enlargement of the staff, increased acreage brought under organized fire protection, extension of educational activities, promotion of forest management plans whereby Georgia's timber lands will produce maximum of timber, and enlargement of the scope of research.

Federal Research Agencies

Under the head of "Research Aid to Georgia Forestry", the directors of the Southern Forestry Experiment Station, New Orleans, and the Appalachian Forest Experiment Station, Asheville, were heard.

E. L. Demmon, New Orleans, said the southern station had attacked the most vital problems first. Six branch stations have been established and additional ones are to be located as funds are available. Naval stores investigations center at Starke, Florida. The influence of fire on tree growth and the effect of grazing are among the studies. Forest management studies are being made, including natural reproduction under various methods of cutting and the influence of soil, competing vegetation, grazing, turpentine and weather. When to thin and to what stand are studied. Reforestation of denuded lands to determine economic practice is being studied, also the rate of growth of stands under natural conditions. Various lines of work to determine economic treatment of pines for maximum returns from naval stores are being carried on. Erosion with reference to forests is being investigated and financial aspects of growing timber have been studied by making surveys in typical regions of the south. A survey of hardwoods of the south is being undertaken. Other interesting lines of research were referred to briefly.

E. H. Frothingham, Asheville, reviewed briefly the work of the Appalachian Forest Experiment Station in relation to the timber regions of northern Georgia, explaining that in some particulars the work was of a similar nature to that recounted by Mr. Demmon but dealt with entirely

different conditions. Trees of the mountains are hardwoods of many species, many of which are of high value. In the last 50 years the magnificent mountain forests have been reduced to a vestige of what they were, there being less than 2,000,000 acres in the Southern Appalachians that could be classed as primeval.

Timber growing, he said, was only one use of the Appalachian forest. Of great importance is the protection of the water supply and the forest's prevention of erosion. Recreation was emphasized as having important bearing on mountain forests. North Georgia mountains are natural playgrounds for Georgians, and fish and game hunting depend on forests to no small degree.

Attention was directed to establishing research work in cooperation with Georgia Forest Service and the Georgia Experiment Station at the latter's branch station in Union county, by virtue of \$5000 secured by Senator Harris from federal funds. Here important studies are to be made on various phases of forestry that will have practical bearing on the best management to give forested areas in the mountains.

Railroad's Forest Experience

The last speaker on the program of the morning session was Roland Turner, Agricultural Agent of the Southern Railway, who spoke on "A Railroad's Experience in Fire Protection". Mr. Turner's address proved one of the most interesting of the conference. He told of a tract of 10,000 acres of land purchased many years ago in Dorchester county, South Carolina, to provide fuel for railroad engines before coal came into general use for that purpose. In 1925 the Southern Railway decided to use the area as a demonstration forest. At first the tenants were of one mind in believing that fires could not be kept off of the tract. They were indifferent to appeals but since they were honest in their belief, it was considered advisable not to combat their views but to proceed by educational methods. Today every tenant is converted to fire protection and ready at any moment to fight fire.

Several fires, said Mr. Turner, had started during the period of protection. Investigation revealed that only two originated from railway engines and these were under unusual conditions. The railroad runs directly through the timbered area. Firebreaks are maintained 100 feet from the railroad.

When people on the land are educated to the importance of fire protection, keeping out fires, he said, is an easy job. He agreed with Mr. Anderson that finding a ready market for timber would be the best fire protection that could be found.

A luncheon served at the Gordon Hotel was the occasion for introducing a num-

ber of prominent people for brief statements. The occasion proved a delightful feature of the conference.

Better Forest Fire Laws Needed

One of the most informative and interesting addresses of the conference was that of Judge Ogden Persons, Forsyth, Georgia, the first speaker of the afternoon session.

The first interest in tree growing in Georgia, said Judge Persons, was that of General Oglethorpe's settlers who had as one of their chief objectives the planting of mulberry trees, the growing of silk worms and the production of silk for British people. These settlers marveled at the natural forests. Those forests have largely disappeared. Now it is a matter of conserving what is left. Today the potential is greater than the actual value of the forests.

Georgia, he said, like other states, has not yet realized the importance of laws for protecting its forests. He reviewed acts of the legislature of 1811, 1847 and 1878, designed to protect lands and crops from woods burners. He then cited a decision of the Supreme Court which rendered of no effect the laws in case fires originated from farm lands in course of crop preparation and spread to adjoining properties. This left no recourse to law except under the general law providing civil action for damage through negligence or criminal intent.

Existing statutes are imperfect in view of the decision of the Supreme Court, and these should be remedied as soon as possible by new acts of the legislature. With strong laws, educational activity, help of the press and vigorous enforcement by the courts, laws designed to protect the interests of the timber owner may be made of real value to the state, he said.

Multi-Product Pines

"Tiny, Living Cells Today Build Multi-product Pines", was the subject of Dr. Eloise Gerry, of the United States Forest Products Laboratory, Madison, Wis. Miss Gerry's address was one of the most interesting and informative of the conference. She is working in a biological way with naval stores pines and is finding out many interesting and very useful facts about how pines produce gum and how they can be made to produce a maximum flow at lowest cost. The expressions "dual purpose pines" and "triple products pines" do not do the pines justice, she said, as they are capable of producing multi-products and should be so designated. Dr. Gerry reviewed her work in the south of numerous projects carried on in Georgia. In 1922 there was talk of the extinction of the naval stores industry in Georgia. Second growth pine brought this industry back.

A description of the part cells play in wood structure and particularly in pro-

ducing gum or oleoresin was interestingly given. Wounding the cell causes it to function in a hitherto inactive way, to make oleoresin. This is an entirely different product from sap, and exudes from trees when cut. Cutting trees for gum, she said, does not injure the trees' wood, in fact, improves it.

How the research workers had found that making narrow hacks or streaks of 1-4 inch as compared to 3-4-inch doubles the yielding period, thereby resulting in greater income, was explained by Dr. Gerry.

She told of the possibilities of using southern pines for paper and distributed samples of beautiful white, strong paper made from slash pine and from combinations of slash pine and black gum, made at the forest products laboratory. The resin content of second growth is low and presents no difficulties and even where it exists, she said that a way had been found for taking care of it.

Timber for Railroads

S. R. Young, Assistant Chief Engineer of the Atlanta and West Point and Georgia Railroads, was next heard in an informative address on, "Timber and Railroads".

"Due to a widespread misunderstanding regarding conservation, the idea has gone abroad that the use of substitutes for wood is necessary to preserve the forests. This is not true", he said. "Tremendous second growth lumber operations have been in progress and but for this railroads would have had a hard time", he commented.

Attention was called to railroad demands for ties and poles. One hundred million crossties are required by the railroads of this country annually. The railroads use approximately 20 percent of the timber cut annually in this country and will continue to be large consumers, for no material combines lightness, strength, resilience, ease of working and availability as does wood. The only criticism of wood is its lack of durability. He told how by chemical treatments the life of ties and poles are remarkably prolonged, and in this way effective reduction of the cost of the largest single item of maintenance, crosstie replacement, is offered, the life of crossties being increased twenty years in this way.

In wooden car construction one quarter billion board feet are used by railroads of this country annually. Standardizing these materials, he said, would result in economy. While steel must be continually painted to prevent rust, wood may be readily protected against decay by chemical treatment. For trestles the American Railway Engineering Association sponsors the state ment that creosoted wood trestles are more economical than concrete except when the cost of concrete structure i

less than one and one-half times the cost of the wooden structure.

Mr. Young stated that his railroads were cooperating in every possible way with state and federal forestry agencies and are giving considerable space in their Agricultural Bulletin to promotion of forestry.

Georgia's National Forests

"The National Forests of Georgia" was the subject of an interesting paper by Joseph C. Kircher, regional forester of the United States Forest Service. Georgia, he said, had permitted the purchase of national forests in the mountains of North Georgia and two, the Cherokee and the Nantahala national forests, extend into Georgia. He said the federal acquisition program called for the purchase of 600,000 acres in the area, of which about 300,000 acres had been purchased.

The expenditure for fire control on the national forest areas was 4.9 cents per acre in 1930, and a vigorous campaign of fire prevention is being waged to reduce this cost.

Acquired primarily for watershed protection, but little or no damage to watersheds results by proper handling of the merchantable products of the forest with a view to maintaining a sustained yield of timber.

Recreation is being fostered by establishing camps and by extending camping rights with only one restriction, fire prevention. Roads and trails are being constructed, the roads often giving easy outlets to hitherto isolated communities. The financial returns to the counties in which the forests are located amounted to 7 cents per acre in the Cherokee forest and 10 cents per acre in the Nantahala forest, in 1930.

Banquet Addresses

At the banquet held at the Gordon hotel, the toastmaster was Gordon E. Reynolds, of Albany, lumberman, orator and public spirited citizen of whom Albany is proud.

The first speaker was United States Senator Walter F. George, who said he was not on the program and had no prepared address. He directed his remarks to the necessity of dealing with the forest problem through education. He complimented Georgia Forest Service and the State Department of Vocational Education on their cooperative project of teaching practical forestry in the Smith-Hughes rural schools of the state, and said that it had been his pleasure to help promote legislation that will make increased funds from federal sources available to the states for enlargement of the work in forestry instruction. The senator's brief address was well received by his audience.

United States Senator William J. Harris was next introduced as one who is intensely interested in forestry and, by virtue of his committee membership on

affairs of forestry, has wielded great influence and done much for forestry, not only in Georgia but in the country as a whole.

Senator Harris spoke briefly and to the point about what he had been doing and trying to do for forestry in Georgia. He called attention to an appropriation for research in the mountains of North Georgia whereby work had been centered on the lands of the mountain branch of the Georgia Experiment Station in Union county, and funds had been obtained to keep this work going.

Attention was called to an appropriation obtained for establishing a station for research in naval stores, but it remained to be seen whether Georgia or Florida would get this station.

The last speaker at the banquet was Dr. Charles Herty of New York, native of Georgia, and much interested in developing the forestry resources of this state, particularly in the use of southern pines for paper manufacture. Since the meeting of the Association held one year ago at Savannah, much had transpired to make certain that the south is coming to be the paper manufacturing center of this country. His announcement then that second growth slash pine before it formed appreciable heartwood was as well suited to the manufacture of white paper as was red spruce now commonly used, had been confirmed from many sources, including the Forest Products Laboratory of the United States Forest Service at Madison, Wisconsin. A year ago he had in his possession beautiful and strong white paper made from slash pine in the same way red spruce was treated. He told of various paper engineers' tests and their surprise at the results obtained from southern pines.

Three years ago the forest products laboratory said white paper could not be made from southern pines. Now they are making it and they sent samples to the meeting of the Association. Thus progress is being made and rapidly research is disclosing the great possibilities in store. But he said there was much to be learned and more research workers should be on the job.

Dr. Herty pictured what it would mean to the south to have a market for its small second growth pines that should be removed as thinnings from the forest to promote turpentine and lumber growing.

Offers School Prizes

In the course of his address while speaking on the importance of reaching the children with forestry education, Dr. Herty stated that he was prepared to offer a prize of \$175, \$100 of which would go to a school and \$50 and \$25 to students showing achievements in forestry, the basis of award being left to a committee of T. G. Woolford, B. M. Luffburrow and Paul Chapman.

Second Day's Session

The second day's session opened with Captain I. F. Eldredge, forester of the Superior Pine Products Company, with headquarters at Fargo. Captain Eldredge's comments on the addresses were valuable contributions to the session.

Editor's View of Forestry

The first speaker was Miss Emily Woodward, Editor, Vienna, known throughout Georgia as a writer and speaker of ability. "Forestry as I See It", was the subject of an informal discussion, referring to what had been done by the pioneers of the Association and paying tribute to Stone, Judd, Harman, Kayton and others.

The task of saving the forests from fire had as yet, scarcely been scratched as evidenced by the charred and blackened landscape that greets one on every hand throughout the state. While the Association had done much there was no time for back-patting in the face of the necessities. The Association could not afford to let up. No resource of the state is more valuable and none should be more carefully conserved than forests.

Miss Woodward directed attention to our rapid growing species of trees, to the new uses being found for pines in paper manufacture, of new uses of wood in the making of artificial silk, leather, transparent wrapping paper, laquers, etc. She told of European forests where care and utilization are intense and quite profitable.

Speaking of the progress of the Georgia Forest Service, Miss Woodward spoke of its being free from politics and administered by trained, technical men in an efficient manner, and her admonition was, "make politics safe for forestry", otherwise, she added, it would be left to men who have the same attitude as the woods burner has to forests.

Forest Taxation

"The Forest Tax Situation" was a subject of much interest at the conference. It was ably handled by two speakers. George M. Rommel, Savannah, was the first speaker. His paper showed a very thorough study of the problem. He referred to forest tax laws of several states, analyzing their results. At the outset, he referred to reversions of lands to states after their timber had been removed because they could no longer pay taxes and be retained with profit to the owner. He cited Nebraska where taxes are remitted on lands planted to trees; to Massachusetts which offered prizes for tree plantings; and to yield taxes of more modern days. He cited Wisconsin with 10 cents acre tax and 10 percent of stumpage value as determined by the state conservation commission. He also described Louisiana's tax system which includes a reforestation contract extending 40 years with fixed tax assessment for that period, determined by the state conservation commission and parish police-jury. This law

is supplemented by a severance tax or yield tax of 6 percent collected at the time any forest product is harvested.

Attention was called to the fact that in neither Wisconsin or Louisiana had more than 500,000 acres been entered under these acts.

In Iowa, Indiana and Pennsylvania forested land is limited to \$1 per acre tax. California's tax exemption of lands having immature trees and Oregon's release of lands under reforestation from general property tax with yield tax of 12 1-2 percent at harvest were cited.

In Georgia, both lands and trees are assessed. Instances were cited in three Georgia counties where improved land was taxed \$1.20 per \$100 value where unimproved land was taxed \$1.60. In Appling county 17 percent of the net forest income was taken as taxes in 1928-29. In concluding, he expressed the hope that Georgia could find a way of protecting its forest lands from excessive taxation.

J. A. Davis, President of the Albany Chamber of Commerce, discussed the problem of taxation from his experience as tax assessor in a case of a large reforestation project where owners desired a lower rate than the commissioners felt they could grant with the consequence that the timber owners were dissatisfied. This he cited as an example of the inability of tax assessors acting under laws requiring the same rate on all properties, to encourage reforestation.

An effort was made to see if lower rates might not be allowed under a classification of "wild lands", but this did not provide the relief desired. Mr. Davis could see no way under existing laws to relieve the forest lands from undue burden of taxes and hoped that Georgia could see its way to discard its antiquated tax system and, in so doing, make provisions whereby timber can be grown more profitably.

Reaching the Man Who Owns The Forest

"Reaching the Man Who Owns the Forest", was the subject of an able address by Dr. Austin Cary, of the United States Forest Service, who has spent several years in direct service to timber owners in this and other southern states. His research work on management of southern pine forests and his studies of the production of naval stores have made him a leading authority in the field. The results of his work have been made public from time to time through the press and have impressed timber growers and turpentine operators with their practical value.

His paper has as its keynote service based on scientific investigations, personal contact with timber growers who are confronting problems, the dissemination of facts well founded in theory and practice, and the extension of information by various educational media.

Dr. Cary warned against over-optimistic claims which in the telling become exaggerated and may result in disappointment and discouragement of the timber owners.

School Work in Forestry

One of the outstanding addresses of the conference was that of Professor Paul Chapman, director of vocational agricultural teaching in Georgia, who outlined in a most interesting manner the work being done on a forestry project in 150 rural high schools in Georgia, with 5,000 students taking the work in forestry; with every white school except three having a school forest under lease for 10 years, on which the practices of forestry are carried out under the direction of the Georgia Forest Service.

Georgia is the first state to inaugurate this unique project which was conceived by the Georgia Forest Service and in which the Vocational Agricultural Department was glad to cooperate in carrying out. The work, Professor Chapman said, had attracted wide attention and other states are planning to follow Georgia's lead. The subjects taught and put in practice on the school forest, he said, were the collection of tree seed, operation of a tree seed bed, planting of seedlings, identification of trees, thinning, measuring the volume of standing timber, fire protection and uses of woods.

Students are given credit for carrying out on their home forests principles taught in the school. As an indication of what interest is being taken by teachers and pupils, the work accomplished by two schools was cited.

The forestry project, he said, had proven the most interesting of all undertaken by the schools. This interest has been heightened by establishing a forestry summer camp which students can attend by winning in a competitive examination.

Training Foresters for Georgia

"Training Foresters for Georgia", was the subject handled by Professor G. D. Marckworth, the new head of the School of Forestry of the State College of Agriculture. He called attention to the need for trained foresters in Georgia, of how the staff of the Georgia Forest Service is composed largely of graduates of the forestry department of the college, and of the necessity for having men trained for southern forestry conditions in the south. This he believed could best be done by an institution located in the south. In addition to forest areas in Middle Georgia and in the mountains of North Georgia with which the students of forestry are dealing in a practical way, he said a camp would be located in South Georgia where at least three months' work would be carried on by advanced students.

The Georgia Forestry Association was asked to lend its assistance for the up-building of the state's forestry school so

that it may not only serve the state's needs but help other southern states that have no institutions teaching forestry.

School Program

A program for high school students was held in the Albany theater beginning at 11 o'clock Thursday morning. In attendance were high school students from Albany, Leslie, Sylvester, Sumner, Ty Ty Moultrie and Camilla. After brief talks by C. A. Whittle and C. N. Elliott of the Georgia Forest Service, the forestry moving picture "Partners" was given. A very interesting part of the program was the singing of a chorus of girls under the direction of Mrs. Perry. The numbers were beautifully rendered.

Field Demonstrations

During the afternoon of the last day a field demonstration in fire-break construction and fire fighting was given under the direction of H. M. Sebring, assistant state forester. Tractors and plows and a rototiller were used for plowing firebreaks. Successful demonstrations were made on swampy soil by a caterpillar type tractor and plows. Fire fighting implements were used in suppressing fires in sedge grass and a tractor was used in plowing a fire break to stop a fire. The demonstration was well attended.

Exhibits

As is customary, exhibits were made at the conference by the Georgia Forest Service. Its activities were pictorially displayed and panels showing effects of fire and thinning on growth and returns from forests proved instructive as did an exhibit showing the folly of turpentineing small trees.

Exhibits were made of aluminum treated wood, chemically treated wood for fire resistance, woods of Dougherty county, fire pumps, Appalachian trail in Georgia, plaques honoring the Albany Fire Department for the international records it has made; samples of very high grade gum, segment of a pine tree displayed by the Starke, Florida, Experiment Station showing remarkable growth in healing turpentine wounds, a map of a typical timber protective organization and literature of the highway department on roadside plantings.

The Association re-elected its old officers, headed by T. G. Woolford, Atlanta as President. The next meeting place is Rome.

A telegram was received by the Association from Hon. Charles Lathrop Pack, President of the American Tree Association, extending greeting and expressing gratitude at the way the Washington bicentennial tree planting project is being advanced in Georgia.

GEORGIA FOREST LOOKOUT

Volume 1

ATLANTA, GA., JULY, 1931

Number 7

HIGH QUALITY PAPER FROM SOUTHERN WOODS

Progress Made by United States Forest Products Laboratory in Making Paper from Southern Woods Very Encouraging.

At the recent session of the Georgia Forestry Association, Dr. Eloise Gerry, connected with the United States Forest Products Laboratory, brought samples of paper made of southern woods at the laboratory. High class white bond papers made of 100 per cent slash pine, by the sulphate process and by the sulphite process were displayed; also white paper of high quality made of 50 per cent slash pine and 50 per cent black gum. Newsprint made of 90 per cent ground wood of slash pine and 10 per cent sulphite slash pine; also newsprint made of 50 per cent sulphite and 50 per cent ground wood of slash pine were exhibited.

Beautiful white book paper was made of half black gum and half slash pine by the sulphite process; also half slash pine sulphite and half ground wood of black gum. Fine white paper made of 100 per cent black gum was among the samples.

Dr. Gerry stated that the laboratory had not produced on a commercial scale but the findings were available to commercial interests.

In a recent issue of the "Log of the Lab", issued from the Forest Products Laboratory, the following is taken from an article entitled "New Pulpwoods and Wood Pulps":

"Production of strong white sulphate pulp from southern pines, a high-grade and very useful paper-making material developed through improved cooking and bleaching methods. This product is of particular interest to the established kraft industry.

"Book paper from southern pines and gums. A process involving two-stage bleaching. This is now in commercial

(Cont'd on page 2, Col. 1)

H. G. SPAHR, PIONEER GEORGIA FORESTRY

H. G. Spahr, Atlanta, is a pioneer in forestry work in Georgia. Mr. Spahr is a graduate in forestry at Pennsylvania State University and was for a time supervisor of the Cherokee National Forest. He became secretary of the Georgia State Highway Department and remained active in forestry matters. His training in forestry and his appreciation of the possibilities of Georgia forests made his services quite valuable.

Mr. Spahr, Bonnell Stone and C. B. Harman canvassed the state and roused the interest that resulted in promoting the Georgia Forestry Association and legislation that created the Georgia Forest Service. It was the late James Hollomon who dubbed the trio the "Forestry Crusaders".



H. G. SPAHR, ATLANTA, GEORGIA,
FORESTRY PIONEER.

GEORGIA'S RANK IN LUMBER PRODUCTION

Census Report Shows Georgia Maintains Prominent Place in Production of Pine Lumber, Shingles and Lath.

According to the decennial report issued by the Bureau of the Census in Washington, Georgia ranked high in the output of lumber and lumber products in 1929. The report reads in part as follows: "The production of yellow pine lumber in 1929 was reported by 21 states, in five of which, Alabama, Georgia, Louisiana, Mississippi and Texas, the output was more than one billion feet each". The aggregate amount of pine lumber sawed in Georgia during 1929 was 1,386,250,000 board feet for lumber, laths and shingles. The number of mills reported in operation in the state was 1,692.

The total number of board feet of hardwood sawed in Georgia including such species as ash, chestnut, hickory and elm, used for lumber, laths and shingles was 196,411,000 board feet.

Of the 1,692 mills listed for Georgia, 1,658 were classes as No. 1, 2 and 3, cutting less than 5,000,000 board feet of lumber during the year.

New Naval Stores Laboratory

Carrying out the provisions of an act of last Congress, a new naval stores station is to be established at Olustee, Florida, near Lake City and in the heart of the great turpentine producing area of Georgia and Florida.

The laboratory is in charge of the United States Bureau of Chemistry and Soils and will work on distillation and marketing methods. The Southern Forestry Experiment Station has the forest production phases under its control.

Research work by these two Federal agencies is expected to develop information that will mean better days for the naval stores industry.

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High Quality Paper—Cont'd.

production in certain southern mills. Two-stage methods of bleaching have been extended to many other types of pulps in the North and West as well as in the South.

"Production of sulphite and groundwood pulps from young slash pine. Satisfactory newsprint papers have been made at the Laboratory by combining these pulps in proper proportions. This development is noteworthy, as heretofore the southern pines, because of their resinous character and high percentage of heartwood, have not been considered suitable for sulphite or groundwood pulps. However, as recently pointed out by Dr. C. H. Herty, a specialist in southern forestry matters, young slash pine is practically free from heartwood and is low in resin. Moreover there is an abundance of this species coming in as second growth on the cut-over forest lands of the South. Special acknowledgment is due to Dr. Herty for his contribution in this connection.

"Sulphite, groundwood and semi-chemical pulps from black gum or other hardwoods, valuable as filler for newsprint and book papers. 'Black' gum happens to be among the whitest of all known woods and requires little or no bleaching according to its use."

Judge Ogden Persons, Forsyth, who is an official of the Georgia Forestry Association and member of the Advisory Committee on State Forest-Parks, is spending the summer in Europe.

"Georgia is one of the most productive states in the Union as far as its timber is concerned. It is certainly like no other state in the Union in the wood resources of this area." Savannah Press.

MARVIN LLOYD HAS BEST PAPER

To Marvin Lloyd of Chamblee goes the honor of the best paper on forestry turned in during the recent examination held for selecting students from all over the state to attend the forestry camp at Young Harris College this summer.

While Mr. Lloyd had some close competition for this honor, his paper was a very excellent one and showed that he had spent much time in preparing himself for the examination.



MARVIN LLOYD, CHAMBLEE

WASHINGTON ATTORNEY HIKES GEORGIA MOUNTAINS

Myron H. Avery of Washington, D. C., Admiralty attorney for the United States Shipping Board, was a recent guest of the Georgia Appalachian Trail Club. Mr. Avery arrived in Atlanta on June 3, went from there to Mt. Oglethorpe in the Tate Mountain Estates, Pickens County, and hiked northward over the Appalachian Trail to Wallace Gap, 170 miles. He was accompanied along the route by members of the Georgia Appalachian Trail Club.

Mr. Avery said at the Appalachian Trail Club conference in the Great Smoky Mountain Park that he had no idea of the magnitude and beauty of the Georgia mountains, or of the extensiveness of the forests; that until a short while ago he was one of those who did not know that Georgia had any mountains, but that during this trip he had thoroughly learned that part of his geography.

VOCATIONAL CAMP BEGINS YOUNG HARRIS JULY 27

Boys Selected—Teachers Chosen— Great Three Weeks' Program Planned for Mountain Camp.

The stage is set for the first Vocational Forestry camp to be held at Young Harris College, July 27-August 15. Fifty-six boys were selected from vocational schools to attend this camp which will be the first of its kind ever held in this country. The camp will be held in the heart of the Georgia highlands for three weeks. Approximately 20 teachers will be selected by the state vocational directors to attend the camp.

Besides the regular work that will be demonstrated by the members of the Georgia Forest Service staff and carried out in detail by the boys, the directors of the camp plan to present special programs of motion pictures, lectures by prominent men in forestry and allied subjects, and trips will be made to rayon mills, paper mills, saw mills, experiment station and national forests.

Besides teaching practical forestry, an earnest effort will be made by the directors of the camp to build up leadership among the boys who may be our foresters of tomorrow.

GEORGIA GETS APPALACHIAN TRAIL CONFERENCE FOR 1933

During the annual meeting of the Appalachian Trail Conference at Gatlinburg, Tennessee, in the edge of the Great Smoky Mountain National Park, June 12, 13 and 14, the Georgia delegation consisting of six members from the Georgia Appalachian Trail Club were able to secure the conference for 1933 at Mt. Oglethorpe, in the Tate Estates, the "End of the Trail."

Each section of the trail was represented at the meeting by delegates. An interesting account was given of the work being done on each section. Georgia stood high among the leaders. The following is a list of "jobs" done by the club since its organization, eight months ago:

1. 40 wooden signs erected.
2. 2,000 metal markers put up.
3. 120 miles of trail constructed or maintained.
4. Several hikes taken to scenic or historic spots.
5. Issuing of the Georgia Appalachian Trail Club booklet.

The club has, in addition, advertised the mountains of North Georgia to a large extent and opened up several beauty spots to the public.

FIRST DISTRICT

**W. D. Young, District Forester
Rome**

Reinhardt College Grows Seedlings

During the spring Mr. L. T. Hagood, Vocational Teacher at Reinhardt, became interested in growing different tree seedlings, not only for the forestry project instituted at that school, but for the general planting up of all the unimproved and abandoned land on the school property.

Four 4 x 12 foot beds were constructed and planted to Loblolly Pine, White Ash, Black Locust, and Yellow Poplar.

A good stand resulted in every bed with exception of that one planted to Yellow Poplar.

Dawnville School Plants Slash Pine

Mr. I. E. Carson, Vocational Teacher at Dawnville School, Whitfield County, planted 2000 seedlings this spring on the school demonstration forest; one thousand of which were Slash Pine. The slash pines were planted for experimental purposes and are doing nicely in their new home in north Georgia.

**New Acres Added to Established
T. P. O.'s in First District**

Two thousand acres were added to the Martha Berry T. P. O. in Floyd county and 6000 acres were added to the Polk county T. P. O. in Polk county.

Efforts are being made to establish new T. P. O.'s in Dade, Floyd, Bartow, and Walker counties. Several of the owners in these counties have already been signed up.

With the establishment of T. P. O.'s in the above named counties, the protected area in District No. 1 would be increased over 125,000 acres.

SIXTH DISTRICT

**Jack Thurmond, District Forester
Savannah**

Liberty County T. P. O. Expanded

On May 16, 1931, the Liberty County Timber Protective Organization met in Hinesville, Georgia, and made up its budget and arranged its work plans for the fiscal year, July 1, 1931, to June 30, 1932.

The per acre assessment was fixed at 5.8 cents on each land owner. The same work plan used last year was adopted for the coming year. The Secretary-Treasurer-Patrolman was reelected. It was also agreed that an assistant patrolman be employed for February and March, 1932. The plan of fire-break work is to maintain the 75 miles already constructed and to construct 50 miles of new fire-

breaks. In this way the organization will be able in a few years to have its lands blocked up in small sections, and lessen the cost per acre each year.

Last year—the first year—the T. P. O. had five members and 17,045 acres. This year the membership has been increased to twelve with 21,078 acres. Before work begins, a good many small land-owners will join, as several have already expressed their desire to do so. W. I. Stafford, Secretary-Treasurer-Patrolman Liberty County T. P. O.

Long County T. P. O. Formed

On May 12, 1931, a meeting was held in the county court house at Ludowici, Ga. Fourteen landowners were represented at this meeting and the Long County Timber Protective Organization was formed. Hon. T. L. Howard was elected President, Mr. E. B. Rimes, Vice-President, and Mr. T. D. Houston, Secretary-Treasurer. To begin with 11,800 acres were signed and we hope to increase this amount before August to 20,000 acres. This organization will be run on a per acre assessment. A patrolman will be employed to direct all the work, including fire-break construction and patrol over the area.

The Organization now has eight members and we hope to double this number within the next two months as interest in fire protection in Long county is very high.

**SEVENTH DISTRICT
E. Bernard Beale, District Forester
Waycross**

**Fires Spotted While Young on
Suwannee Forest**

Stretching over the lower part of Clinch county and covering half of Echols county is an area of flatwoods, 200,000 acres in extent, comprising Suwannee Forest. Headman over this great tract of land is Capt. I. F. Eldredge, forester of the Superior Pine Products Company, operators of Suwannee Forest.

It is the job of Captain Eldredge to protect this forest from fire, provide for satisfactory restocking of the cut-over areas, and direct its management for a sustained yield of timber, turpentine and other forest products.

Assisting Capt. Eldredge in the year-round fight against fire is a basic personnel of one assistant forester, W. M. Ottmeir, who has charge of the logging and lumbering, and a crew of ten men. Chief ranger in charge of fire protection is J. M. Cameron, assisted by Alex. Hunter, J. M. Young, Jr., Josh Lanier, J. E. Padgett, and Baxter Petty.

Each ranger has a district to patrol, inspecting turpentine chipping, and watching for fires. Supplementing the rangers is a fire crew composed of Warren and

W. G. Hughes, who also work on fire breaks and telephone lines. Manning the three lookout towers are Charlie Zanders, Zimmie Petty, and Chester Cameron.

Confronting the above organization, headed by Capt. Eldredge, who often responds to fires himself, is the task of spotting and suppressing the fires on this forest. Such would be impossible were it not for the splendid type of men in the personnel and the coordinated systemized effort in which each fire is handled. Getting at the fire while it is still young is the motto on Suwannee Forest, and it is this motto spirit backed by the prompt, courageous, and determined effort of these men that the fire loss on Suwannee Forest is kept at a highly satisfactory minimum.

"Old Man" Graddy

Woodson Graddy, seasoned and vigorous ranger on Suwannee Forest, was feared by all law violators. With daring and impartial justice, "Old Man" Graddy rode the woods, "fit" fires and apprehended violators with impeccable devotion to his duty. He even had his own son arrested for hunting in a pasture which had been set aside as a game reserve.

Getting along in his seventies, "Old Man" Graddy felt he could not last much longer, came in to the office of the Superior Pine Products Company at Fargo, laid his pistol and badge on the desk, and announced his resignation. Captain Eldredge, forest manager, agreed to let him go, and Woodson Graddy went back to his remote flatwoods shanty to die, suffering from heart disease.

One day not long before his death, Graddy summoned Capt. Eldredge. He directed Capt. Eldredge as to the manner in which he wished to be buried. The fire crew, with whom he had fought many a fire, was the only fraternity in his hard life toward which his remembrance was kind and perhaps even fond. It was his agreement with Capt. Eldredge that the fire crew should bury him, without clergy, or ceremony. His grave was to be brick-ed in.

Capt. Eldredge promised to carry out his wishes, but "Old Man" Graddy was not to be satisfied until Capt. Eldredge had had the brick unloaded at the site of the grave, and the old man had made a careful estimate to determine if there were sufficient brick to properly entomb him.

Six weeks later, Graddy died. Capt. Eldredge, true to his promise, had a coffin built and went, accompanied by Mrs. Eldredge, with the fire crew to bury "Old Man" Graddy in a brick tomb in the family plot. There, not far from his native shanty, in the remote wilds of the flatwoods, the Old Man, who had lived fearlessly, was lowered in his grave by his fellow fire-fighters, without prayer or song or rite, as he had desired.

EDITORS ENTERTAINED AT VOGEL FOREST PARK

At the close of the annual meeting of the National Editors' Association in Atlanta in June, excursions were made to various points of interest in the state, among them Vogel Forest Park at Neel Gap in the Blue Ridge mountains. This park is operated by the Georgia Forest Service.

The editors were thrilled with the view and beauty of the situation. Hon. Bonnell H. Stone, member of the State Board of Forestry and secretary of the Georgia Forestry Association, spoke to the editors about the park program of the state and of Georgia's great forest resources. An exhibit relating to forest-parks and forest activities of the state was presented in one of the buildings.

Moore-Wallace

These foresters! They must have some sort of an attraction about them. The Georgia Forest Service is interested to learn that its youngest district forester, Mr. Gordon Wallace, Columbus, took unto himself a new boss on May 31, 1931. Miss Vivian Louise Moore, of Chamblee, from which town Mr. Wallace hails, is the bride.

The Georgia Forest Service wishes to extend to Mr. and Mrs. Wallace sincere wishes for continued happiness. We shall now fall to wondering whether "E. B." or "C. B." will be next.

APPALACHIAN FOREST EXPERIMENT STATION COUNCIL

An interesting session of the Council of the Appalachian Forest Experiment Station was held in Asheville, North Carolina, June 3 to which a number of persons were invited.

Various lines of work of the station carried on under E. A. Frothingham, director, were outlined by members of his staff, showing a wide range of important research. Georgia was represented at the meeting by State Forester B. M. Lufburrow, Bonnell H. Stone, secretary of the Georgia Forestry Association, and C. A. Whittle, Director of Education of the Georgia Forest Service.

Forestry Graduates

The Forestry School of the Georgia State College of Agriculture graduated 13 foresters in June. The school now has an enrollment of 63, the largest in its history. Prospects for an increased enrollment next session is reported. This school of forestry is the oldest in the South.

"Georgia is one of the most productive states in the Union so far as its timber is concerned . . . Savannah, like no other city in the state, profits by the wood reserve of this area." Savannah Press.

DESTRUCTIVE ELM DISEASE

The "Dutch Elm Disease" which is proving very destructive to elms in Europe has appeared in Ohio, in spite of all efforts to keep it out of this country. If it gets a start it may prove as disastrous as chestnut blight has proven to native chestnuts.

Wilting of twigs is the first visible sign of the disease. If an examination reveals the sapwood of the twigs to have brown stains further evidence of the disease is obtained.

The Dutch Elm Disease Laboratory established at Wooster, Ohio, will welcome information as to the appearance of the disease anywhere.

AMERICAN FORESTRY ASSOCIATION MEETING

The annual meeting of the American Forestry Association was held at Asheville, June 3 and 4, and was well attended. A program of unusual interest was presented with such speakers as Dean H. S. Graves of Yale, Secretary R. L. Wilbur of President Hoover's cabinet, H. H. Bennett of the United States Bureau of Soils, and R. Y. Stuart, Chief of United States Forest Service.

Much interest was taken in the exhibit features of the Association, several federal and state agencies being represented. The excursions to points of interest in the forested mountains also proved interesting to the visitors.

Improvements at Indian Springs

Improvement continues at Indian Springs. A 340 foot guard fence has been completed around the parking area. Many picnic and other organized groups visit the state park and the last few Sundays have seen large crowds visiting the park.

TRAIL CLUB BULLETIN

The Georgia Appalachian Trail Club has just issued a new trail guide to the mountains of North Georgia. This unique publication tells of interesting spots that may be reached by automobile and trail, touches on Cherokee lore, gives interesting bits of mountain history and carries several articles of general interest.

The booklet is the first of its kind to be issued in Georgia.

FEDERAL FORESTRY PROGRAM IN SOUTH.

The annual report of Director E. L. Demmon of the Southern Forest Experiment Station at New Orleans says:

"Among the increased Federal appropriations made available to the Southern Station this fiscal year (1931) are the following: \$25,000 for the initiation of the Forest Survey in the southern bottomland hardwood region; \$10,500 for growth and yield studies in the bottomland hardwoods; \$10,000 for investigations of the relationships between fire and resin yields in naval stores operations; and \$10,000 for investigations of methods of cutting to insure natural reforestation in second-growth yellow pine stands.

"In addition to these regular Station allotments, cooperation is carried on with the Bureau of Plant Industry, whereby two forest pathologists are assigned to the Station Staff. Considerable assistance in the form of temporary help has been furnished by a number of State Forestry Departments in the South. The Station has the advantage of close cooperation with a great number of Federal, state and private agencies throughout the southern region."



GROUP OF STUDENTS, CARNESVILLE, STUDYING FORESTRY.

GEORGIA FOREST LOOKOUT

Volume 1

ATLANTA, GA., AUGUST, 1931

Number 8

BIENNIAL REPORT FOREST SERVICE

Some Interesting Facts About Progress Made in Forestry in Past Two Years — Department Without a Deficit During its Entire Existence.

The Third Biennial Report of the State Forester was issued in July, reporting activities of the years 1929-30.

Some of the interesting facts brought out in the report are the following:

Georgia has the greatest forest acreage in the Union, 23,750,000 acres.

Georgia forest products exceed \$100,000,000 annually.

Organized forestry in Georgia is now directed by a board of which the Governor is chairman with three other ex-officio members and five interested citizens.

Board members serve without salary, receiving only traveling expenses at an average cost of less than \$300 a year.

An average of seven of the nine board members have attended meetings for five years.

All funds—State and Federal—are spent under a budget. No deficit has ever occurred.

Activities are conducted by the Georgia Forest Service consisting of a state forester, director of education and utilization at the Atlanta office; assistant state foresters at Macon and Gainesville; district foresters at Rome, Columbus, Albany, Waycross and Savannah, and an assistant director of education of Atlanta.

None of the eight officers pay a cent of rent, room being given free by Chambers of Commerce for branch offices.

Fire protection, education and reforestation are the chief activities of the Forest Service.

Under a plan originating in Georgia, consisting of Timber Protective Organizations, composed of timber owners, 1,302,-

(Cont'd on page 2, Col. 1)

EX-GOVERNOR DORSEY PIONEER IN FORESTRY

First Governor to Advance Forestry Department in Georgia in Message to Legislature—Has Seen Hopes Materialize.

Ex-Governor Hugh M. Dorsey was the first governor of Georgia to have a vision of forestry development in Georgia and advocate the development of a forestry department in his message to the General Assembly. He has seen his ideas materialize. It is, therefore, quite fitting that he

(Cont'd page 2, col. 2)



JUDGE HUGH M. DORSEY.
First Governor to Advocate Forestry in Georgia.

OUTSTANDING SCHOOLS IN FORESTRY WORK

Vocational Agricultural Schools Make Splendid Showing in Second Year's Work in Forestry—Project Proves Popular with Students and Teachers.

Several vocational schools in the state did exceptional work in forestry last year. The following is taken from a report by the Educational Department of the Georgia Forest Service to the State Forester and the Vocational Department. The schools are given in their alphabetical order.

Georgia Industrial College, Barnesville—

In spite of the fact that almost none of the boys attending the school were resident at the school, four boys had some demonstration plots upon which they did work, and 64,000 acres of land were included in the fire survey, all fires occurring on the area surrounding the school being reported.

A log cabin was built on the school forest by the forestry club and used as a club house. In front of the cabin, a lookout tower was constructed in the top of a tall pine. Three hundred and fifty lantern slides were shown.

Chamblee High School—Twenty out of twenty-seven forestry students had home projects on which they applied lessons of forestry learned in school. Several pounds of seed of the different species of pine were collected. The boys seemed to have given a good deal of time to the study of forestry as shown by the examination papers presented. This school ranked first in grades of papers submitted in selecting boys for the summer camp.

Commerce High School—Work done by the forestry students induced farmers to set out 37,000 seedlings during the spring. Seed from five species of trees were collected by the students, approximately 500

(Cont'd on page 2, col. 2)

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 W. G. Wallace, District Forester, Columbus
 Mrs. Nellie Nix Edwards, Secretary to the State ForesterAtlanta
 Mrs. R. S. Thompson, Secretary to Director of Education and Utilization, Atlanta

Biennial Report—Cont'd

526 acres are now under intensive fire protection. This plan is approved by the U. S. Forest Service which allots funds, paying a part of the cost.

For the two-year period 1929-30 the sum of \$139,275 was spent in forestry work in Georgia. Of this amount, organized timber owners spent \$46,016.66, the State \$26,937.90 and the federal government \$39,331.57.

For every \$1.00 contributed by the state treasury, \$5.12 was spent by private and federal agencies.

Georgia has 100 school forests at as many rural consolidated schools teaching vocational agriculture where the Georgia Forest Service demonstrates reforestation and care of forests. Georgia is the first state to introduce forestry in rural vocational schools.

One hundred farm boys from these schools will attend a forestry camp at Young Harris College July 27 to August 15.

The Georgia Forest Service supports a state tree nursery where tree seedlings for reforestation are sold at cost.

Two state forest-parks are maintained, one at Indian Springs and the other at Neel Gap.

According to the United States Forest Service, forest planting by all agencies in the United States amounted last year to 138,970 acres, a gain of 24 per cent over 1922.

At a recent meeting of hardwood interests held in Memphis, Tennessee, strong resolutions were passed allocating more money for research concerning the properties and possibilities of utilizing southern hardwoods.

Ex-Governor Dorsey—Cont'd

should have a place in the gallery of forestry pioneers in Georgia which this publication is undertaking to set up.

It is hardly necessary to tell who Ex-Governor Dorsey is. It was he who launched during his administration the rural consolidation high schools, over one hundred of which now have school forests and are studying the practices of forestry. In fact his administration achieved so much for education that prominent leaders in education have named him the "Educational Governor."

Governor Dorsey gave impetus to public health work in Georgia and to the care of feeble minded children. The Board of Public Welfare to aid feeble minded and backward children was advocated by him and established under his administration; better marketing facilities for farmers, the "Blue Sky" law for the protection of investors; improvement of water ways; mobilization of state resources for the World War are among his many contributions to the State.

Outstanding Schools—Cont'd

square feet of seed bed being planted. The school planted 4,600 seedlings. A scholarship fund to send a boy to college each year has been set up. Some of the money for this purpose is derived from a large tract of timber managed by forestry classes.

Hollywood High School—This school built a log cabin on the forest plot. A number of farmers became interested in the school project resulting in some good work being done in that section.

Nashville High School—Thirty nine students out of 51 had home projects during the entire year. All of the 51 students had home projects some time during the school year. The students planted 6,000 seedlings. The teacher prepared job analysis sheets dealing with each subject of forestry and copies of this plan were sent to a number of teachers in surrounding schools. A number of adult night classes in forestry were held and much interest was shown. The school collected 3 species of tree seed.

Moultrie High School—This school gave 385 hours to forestry. The boys surveyed their own forest tract, thinning it to the extent of removing 75 cords of wood of undesirable trees. Gallberry bushes were removed so as to have more success with the 1500 seedlings planted in the forest. One large sign and three small signs were erected on the forest.

Union High School, Leslie—This school has several demonstration areas in which to study the growth of longleaf and slash pine in that immediate section. The students planted 5,500 seedlings of which

5,000 were grown in the school seedbed. The students made their own forest working tools such as calipers and Biltmore stick in the school workshop. A good forestry exhibit was made at the county fair. Some outstanding work among farmers of that section was carried on.

In addition to the outstanding work done by the schools mentioned, they carried on routine jobs such as measurements of trees to make growth studies, the burning and thinning of sample plots, reports of fires occurring in their immediate sections.

A summary of the report from the entire group of white schools in Georgia engaged in forestry work is briefly as follows:

98 schools engaged in forestry work.

2,500 boys taking forestry.

249 boys with home projects of one or more acres on which they applied forestry principles learned at school.

3,814 hours were given to forestry by the 98 schools.

51 schools collected tree seed.

42 schools established seed beds and grew 19,650 seedlings.

56,802 seedlings were planted by students.

75 schools put firebreaks around their forests and sample plots.

60 schools made thinnings in their forests.

73 schools burned off their fire plots, tagged all trees on both plots with meta numbers and made diameter measurements of all tagged trees to study growth records on burned and unburned areas.

55 schools sold products from their forest area.

50 schools held adult classes in forestry with the landowners of the school communities.

2,619,313 acres of forest land were covered by the fire survey made by vocational boys, and reports made on the approximate number of acres burned off and the number of fires occurring on this area. 1,602 fires were reported to have burned an area amounting to 175,006 acres. This is estimated to be 6.68 per cent of the total area under observation.

Besides the regular routine jobs mentioned above, several schools did exceptional additional work such as improving their school grounds, assisting in roadside demonstration signs and planting trees along the highways and on school grounds.

C. A. Whittle and C. N. Elliott, director and assistant director of education addressed the teachers attending summer school at Piedmont College, Demorest, June 30, and the summer school at Spelman University in Atlanta on July 2.

FORESTRY CAMP OPENS AT YOUNG HARRIS

Vocational Forestry Camp for Three Weeks—July 27-August 15—Now in Progress—Interesting Program Prepared.

The Forestry camp opened at Young Harris College July 27, for a three weeks session. Students and teachers arrived from the four corners of the state, and on Saturday and Sunday (July 25 and 26) registered for the camp work. The staff of the Georgia Forest Service are instructors in the work. The opening exercises were held at 9 o'clock A. M., July 27th, in the Young Harris College Chapel. Mr. M. B. Lufburrow, State Forester, made a short talk to the boys and members of the Georgia Forest Service were introduced. Mr. M. D. Mobley, assistant state supervisor of vocational education, who is in general charge of the camp, also made a short talk to the boys.

Classes in forestry are being held in both class rooms and in the woods. The field trips were made after the students became more familiar with the subjects taught in the class room.

The students are enjoying summer camp in the highlands of Georgia and seem only to regret that three weeks is the limit this year.

Whatley's Fire Break Costs

Raising timber as a business proposition is considered profitable by W. F. Whatley, Turpentine operator of McRae. He now has approximately 5000 acres of land under fire protection, and the land that has had three years protection shows an excellent stand of slash and longleaf pines. Mr. Whatley uses the solid plowed type of fire break, 6 to 8 feet wide, constructed with two-mule team and turning plow. New fire breaks cost him \$6.75 per mile, while replowed ones are much cheaper.

H. M. Sebring.

"Railway Engineers Association sponsors statement that creosoted wooden trestles are more economical than concrete except when the cost of the concrete structure is less than one and one-half times the cost of the wooden structure. The cost of a concrete bridge is usually more than twice the cost of creosoted bridge of corresponding strength, durability and practical serviceability."

—Wood Preserving News.

State Foresters Harry Lee Baker of Florida and B. M. Lufburrow of Georgia made a trip through Georgia and Florida and arranged for the tour of the State Foresters who are to meet this fall in Georgia and Florida.

SIXTH DISTRICT Jack Thurmond, District Forester Savannah

Treutlen County T. P. O. Growing

The Treutlen T. P. O. is gradually growing in acreage and membership as more timber men in the county realize the advantages and profits to be derived by growing timber as a crop under intensive fire protection and management.

In 1930 this organization numbered three members with a total acreage of 12,800. Today we have six members representing 27,860 acres or 24 percent of the timbered land in Treutlen county, and during the last fire season we only had 80 acres burned over.

The actual fire protection work has been carried on with marked success as the fire reports show, but in addition to this the 227 miles of fire-break that has been constructed, and all other work has made the outsiders stop and think seriously about this business of burning the woods, and we are unable to estimate the educational value of our organization and the work it has done. But we do know that our people in Treutlen county are awake to the possibilities of growing good crops of timber for a profit, and we are sure that our own Treutlen county is far up the line in fire protection work and the benefits to be derived from such work and we are all proud of the showing of the Treutlen county T. P. O.

Longleaf Seed Crop Good

Longleaf seed crop this year will be unusually good as the cones are now almost full grown. It takes from two to three years for longleaf pine to produce a seed crop and about every five years we have an extra large crop produced, so anyone wishing to obtain longleaf seed should begin now to make arrangements for gathering the cones, and if any information is needed as to the methods of gathering, extraction, cleaning and storage see your nearest representative of the Georgia Forest Service.

Rough Woods Furnish Good Grazing in Liberty County

"We have just passed through one of the driest spells ever known in this section, and since the weather became so dry I have noticed that the cattle were grazing in the unburned woods. Whenever I go out in the woods I invariably find the cattle grazing on the rough and are looking fine this year. I am thoroughly convinced that unburned woods furnish more and better grazing for all kinds of weather and for all stock. Taking the year as a whole, in the early spring burned woods furnish a little picnic for the cattle but this is over in from three to four weeks and they suffer the balance of the year

unless they can get to unburned woods.

"All of us desire to make the best provisions possible for all our animals. We would not burn up their food if we knew it, and about the only way to know is to try it out. Ours is a stock and timber growing section. Stock raising and timber growing go hand in hand, and with these enterprises we can compete with the rest of the country fairly well, for it takes more effort and a greater outlay of capital to keep abreast of economic conditions in any other business. The thing we need most is united effort; we have men in every community that can trust each other and work together; these should organize on one thing and stop struggling along single handed. A community working together usually get what they go after while one individual would not even make an impression. To grow timber requires rough woods and the only way to succeed economically is to come together in an organization so that we can obtain State and Federal aid, for we need all the assistance we can secure.

"The Georgia Forest Service through actual experience knows what it takes to get efficient fire protection, and for that reason this aid can be obtained only through organized effort, so if you want fire protection in Liberty county come into our organization and receive the aid that you are entitled to." By W. I. Stafford, Sec.-Treas., Patrolman.

Briar Creek Gets New Members

The Briar Creek T. P. O., when first organized, went under the name of Pfeiffer T. P. O. in Screven county has two new members for the next fiscal year. They are Mr. H. G. Connor and Mr. M. H. Rouse. The acreage of the new members brings the total up to 13,000 acres.

FOURTH DISTRICT W. G. Wallace, District Forester Columbus, Ga.

Taylor County Citizens Interested in Forestry

Citizens of Taylor county are waging an active campaign to eliminate as much as possible forest fires that annually costs the county large sums of money both in actual and potential values. Mr. W. A. Lundy, county agent of Taylor, has taken an active leadership in this educational movement. Among other active citizens of the county are Mr. J. S. Green, manager of the Butler Naval Stores Company; Mr. F. C. Clements; Mr. W. A. Payne; and Mr. T. J. Fountain, one of the master farmers of Georgia.

The Georgia Forest Service is looking forward to cooperating with the land-owners of Taylor county during the near future in organizing a Timber Protective

Organization whereby the landowners will receive financial as well as field assistance from the Georgia Forest Service.

Northernmost Naval Stores Operation

The Butler Naval Stores Co. has made excellent record at its distillation plant this season. Their entire resin supply is from longleaf pine. Their rosin has averaged about 80 percent water-white grade during this season, and this high average can be credited to Mr. N. R. White, their distiller, who has had long experience in naval stores industry. Taylor is the northernmost county of western Georgia to produce naval stores commercially.

REPORT ON GEORGIA'S HIGHLAND FORESTS

Bulletin Gives Results of Cooperative Survey of Forests in Mountains of Georgia—Water Power and Recreation Included.

"Forests of Georgia Highlands" is the subject of a bulletin issued by the Georgia Forest Service giving the report of a survey made in the mountains of North Georgia.

The bulletin was prepared by Charles R. Hursh and Leonard I. Barrett, of the Appalachian Forest Experiment Station, Asheville, North Carolina. The work on which the bulletin reports was carried on cooperatively by the United States Forest Service, the Georgia Forest Service and the Georgia Agricultural Experiment Station, the work being directed by the Appalachian Forest Experiment Station at Asheville. The funds which made the mountain research work possible were obtained from the federal government largely through the activities of Senator Harris.

Several illustrations showing forest conditions in the mountains appear, one of the most interesting of which is a stand of second-growth yellow poplar in Sosebee Cove in Union county, said to be the finest yellow poplar stand in the United States.

The rate of growth of various species, their commercial importance and general considerations in managing these forest areas are discussed, also the importance of the forested mountains for watershed protection are treated.

C. N. Elliott, assistant director of education, spent several days during July visiting boys and girls camps teaching tree identification.

With July 1 the American Forestry Association has adopted its new plan of operation, which will result in a more efficient and unified effort in forest fire prevention.

Southern Pine Damaged By Fires

Mature trees in virgin pine forests of the South, as well as young growth, are injured and often killed by fires, according to E. L. Demmon of the Southern Forest Experiment Station, maintained at New Orleans, La., by the Forest Service of the United States Department of Agriculture.

In the spring of 1927 fires in southern Georgia which followed a 2-month dry period were very destructive to both young and old timber, recent check-ups show. In ponds that had entirely dried out, practically every slash pine and cypress was killed. On the higher ground nearby, longleaf pine also suffered severe damage, particularly those trees which had been turpentine. On longleaf areas that had not been burned for two years previously, 56 percent of the turpentine trees were killed, whereas but 32 percent of the unturpentine trees succumbed. Fires readily ignite old turpentine faces, and the heat is often sufficient to cause the death of the trees. This holds true for most turpentine areas where fire commonly gets in after the turpentine operations have been completed.

Fire Results On Forest Growth Rate

In the annual report of the Appalachian Forest Experiment Station with headquarters at Asheville, some of the results of forest fire studies were given as follows:

"The results of the study on these plots to date definitely show the harmful effects of the annual fires on the reproduction. On the annually burned area most of the hardwoods and loblolly pines under one inch in diameter at breast height, have disappeared except for the hardwood sprouts which have sprung up each year. Also many of the small longleaf pines, especially those under 10 feet in height, are showing the effects of the annual defoliation by a great reduction in vigor. No effects of the annual fires are noticeable yet in the growth of the larger trees.

"During 1930 two 1/3-acre permanent sample plots were established on the Clemson College Coastal Experiment Farm near Summerville, S. C. One of these plots was established on an area which has been burned annually for 13 years and the other on a contiguous area which has remained unburned for the same period. Analyses of the data from these plots show an average reduction of approximately 15 percent in diameter growth and 25 percent in height growth of the individual trees, which may be attributed to the effects of the annual fires."

Dr. Chas. Herty and Forestry Camp

"I think the camp is a wonderful idea, and I certainly congratulate the Georgia Forest Service on this unique plan for developing interest in forestry among the young people of our state."

TREE-A-MONTH "Persimmon"

("Possum Apple")

by

C. N. Elliott

Perhaps the most-loved as well as the best known forest tree in our state is the persimmon. It occurs so commonly in old fields and woodlands that few realize how very interesting it is. Like all familiar objects, we see it, know it is there and do not give it a second thought.

Not long ago a small "darker" used the words "Possum Apple." For a week I wondered what such an apple was and when I saw him again I asked about it. With a tooth-paste ad smile, he told me that he was "talkin' 'bout 'simmons," which I interpreted to be the persimmon.

A few facts about the well-known "Possum Apple" may be interesting:



PERSIMMON

Leaf, one-half natural size
Two, three-quarters natural size.

1. Trees belonging to the same family as this tree produce some of the valuable ebony of commerce and supply a great deal of food to some of the oriental countries.

2. The fruit of this tree is classed as a berry on account of its pulpy character and the way it is formed.

3. The wood of this tree is exceedingly hard and is used in making golfstiel heads, shuttles, bobbins, billiard cues, mallets and for other purposes for which exceedingly hard wood is required.

4. The family to which the persimmon belongs, which is the Ebony family, has about 250 species. These are found mostly in the tropics and sub-tropics. The common persimmon is the only species of the Ebony family native to Georgia.

5. Opessums are exceedingly fond of the fruit of the persimmon, hence the name "Possum Apple."

GEORGIA FOREST LOOKOUT

Volume 1

ATLANTA, GA., SEPTEMBER, 1931

Number 9

CONSERVATION COMMITTEES VISIT TIMBER AREAS

Impressed With Results of Fire Protection, Reforestation and Paper Pulp Possibilities of Southeast Georgia.

A visit was made by the Conservation Committees of the Georgia General Assembly in July to southeast Georgia to study reforestation, fire protection and paper pulp resources where, according to authorities of the United States Forest Service, private forestry is being practiced more successfully than anywhere else in the United States.

The trip was made possible by the Georgia Forestry Association headed by President T. G. Woolford, Atlanta.

Inspection was made of several Timber Protective Organizations where the Georgia system of fire control is in effect. Methods employed, cost and results obtained were ascertained. The reforestation taking place in the form of healthy, young pines where fires are being kept out was a matter of much favorable comment on the part of the legislators.

The legislative committees and friends were entertained royally by civic organizations of Waycross, Colonel Howard Coffin at Brunswick, and Colonel Huston of St. Mary's, as well as by the Georgia Forestry Association.

The committees made a glowing report complimentary to the progress being made in reforestation and forest fire protection and concerning the possibilities of paper manufacture in Georgia. The report was incorporated in the journals of the Senate and House of Representatives as an official record.

The committees reported a most enjoyable as well as instructive trip into southeast Georgia.

PRESIDENT BRITTAIN PIONEER IN FORESTRY

Educator Aided in Launching the Georgia Forestry Association and the Georgia Forest Service.

President M. L. Brittain of Georgia School of Technology, Atlanta, was among the first to get a vision of forestry in Georgia and to lend his influence to the development of the Georgia Forestry Association and the creation of the Georgia Forest Service. His interest and activity in the early days of the forestry movement gave it an impetus and inspiration that has been far reaching in their effects.

As an educator directing the public schools of the state and now as president of a great technological school, Dr. Brittain has always been keenly interested in educating for the full development of the state's natural resources.

It is, therefore, with pleasure that the likeness of Dr. Brittain is displayed in the gallery of pioneers of forestry in Georgia.



Dr. M. L. Brittain.
Pioneer in Forestry in Georgia.

FORESTRY, GEOLOGY AND LEGISLATION

Forestry and Geology Organized Under Commission—Appropriated in Place of Allocated Funds—Georgia Forestry Association Active in Shaping Legislation.

In the movement to reorganize and reduce the number of bureaus of the state government, forestry and geology were joined under a commission of seven members of which the governor is ex-officio chairman.

The original proposal of the reorganization committee of the General Assembly was to create a department in which forestry, geology and game and fish departments were to be consolidated with the head of the game and fish department as director in charge and the state forester and state geologists as assistant directors, and with power given to each incoming governor to appoint a new director and assistants every two years. This plan was opposed by friends of forestry over the state on the ground that two-year appointments would militate against a continuous program of work and introduce politics into a scientific department both of which would jeopardize federal aid.

The Georgia Forestry Association which has always looked after legislative matters in order to keep the Georgia Forest Service free from politics, opposed the reorganization committee's proposal and favored the plan which was finally enacted by unanimous vote of both the senate and house.

A change was made in the methods of raising funds for forestry work. Heretofore the funds raised from the occupational tax of lumber interests were allocated to forestry, whereas now the Georgia Forest Service obtains its funds by direct appropriation from the General Assembly.

(Continued on page 2, col. 1)

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 State ForesterAtlanta
 Mrs. R. S. Thompson, Secretary to Direc-
 tor of Education and Utilization, Atlanta

Forestry Geology—Cont'd

A special appropriation of \$40,000 was made the Department of Forestry and Geological Development to supplement an offer of \$50,000 worth of equipment by the Chemical Foundation of New York for a semi-commercial pulp mill to be used for research work on all pines and certain hardwoods of the State.

This research work is to be under the direction of Dr. Charles H. Herty, a native Georgian, who will have the full cooperation of the State Forest Service and the State Geological Survey.

Dodge County Interested in Protection.

Through the efforts of county agent, W. D. Hillis, of Eastman, a number of timberland owners are interested in forming a T. P. O. in Dodge County. A meeting was held recently and the State form of cooperation was outlined by H. M. Sebring, Asst. State Forester. A large number of landowners were interviewed and an area of 10,000 acres was assured.

More educational work is being done by the county agent and another meeting will be called in September to definitely form an organization to control forest fires. Dodge is a very good longleaf and slash pine timber growing county, and an organized area in excess of 10,000 acres is anticipated.

H. M. Sebring,
 Asst. State Forester.

FORESTRY SUMMER CAMP CLOSES SESSION

**Georgia Forestry Association Prize
 Presented to W. B. Bates, Nashville
 —Camp Pronounced Success.**

With the presentation of the prize for the best work done last year and addresses by Mr. T. G. Woolford, President of the Georgia Forestry Association, Mr. B. M. Lufburrow, State Forester, and Mr. Paul W. Chapman, Director of Vocational Agricultural Education in Georgia, the forestry summer camp ended at Young Harris on August 14.

The camp, which was the first of its kind ever to be held, was unanimously pronounced a success by both the officials in charge of the camp and by the boys and teachers attending. Bill Seaman of Waycross, who spoke in behalf of the boys, said that he was like the "nigger gal" full of watermelon, who when asked if her program was full for the afternoon, said that if it was any fuller, she'd "bust". Mr. Mobley, who was in charge of the camp activities, said he had never spent a more delightful three weeks "on the job". Mr. C. A. Whittle, Director of Education of the Georgia Forest Service, made the statement that the camp was far beyond his expectations in every respect.

During the morning exercises, Mr. Woolford presented the prize to Mr. W. B. Bates of Nashville, Georgia, for the "finest, most original and most diversified program of forestry carried on by any teacher during the scholastic year 1930-31."



W. B. Bates, Nashville, Ga.
 Teacher Who Did Outstanding Work in Forestry and
 Won \$100 Prize



Presenting \$100 Prize to W. B. Bates. Left to right, Mr. Bates, State Forester B. M. Lufburrow, Paul Chapman, Director Vocational Education, T. G. Woolford, President Georgia Forestry Association, which Association offered prize.

At the concluding exercises in the evening, Mr. Lufburrow made a short talk about the program of work of the Georgia Forest Service during the past five years and briefly outlined the program of that organization for the next year or two. Mr. Chapman and Mr. J. T. Lance, President of Young Harris College, also made short talks about the camp spirit in play and work.

Saturday morning car loads of boys and teachers departed for their homes scattered throughout the state, from "Rabun Gap to Tybee lights". Saturday afternoon the laughter, the shouts of boys had ceased, the study of mountain trees had ended and serenity again prevailed at Young Harris College. A task well accomplished by both those who gave and those who received has been recorded.

Four courses of study were carried on by the Georgia Forest Service during the three weeks: Forest Management, taught by Mr. H. M. Sebring, Wood Products, in charge of C. A. Whittle, Forest Surveying, given by Mr. E. B. Stone, Jr., and Tree Identification, taught by Mr. C. N. Elliott. These courses were made as practical as possible and much of the time was spent in the woods.

Besides the regular courses of study several trips were taken to points of interest in Georgia, and adjoining states. In North Carolina the camp visited the Vener Mill at Hayesville, the Champion Fibre Company Plant at Canton, the Great Smoky Mountain National Park, the Appalachian Forest Experiment Station, and the Biltmore Estates at Asheville. In Tennessee the boys visited the denuded hillsides of the Copperhill and Ducktown basins. In Georgia, Sosebee Cove, where the largest stand of Poplar in the United States is located, Lake Burton, Enotah Bald Mountain and Blood Mountain at Neel Gap seemed to be the main points of interest to the classes.

Of the outdoor and indoor sports in camp, tennis, horseshoes and checkers seemed to be the favorites. The cham-

pions from these various forms of sports were picked by tournaments during the latter part of camp. A boxing exhibition was given by some of the best fighters during the last night but no knock-outs were recorded.

Several prominent speakers were on the program during the camp. Reverend Nath Thompson spoke to the boys on sportsmanship and clean living in the woods. Mr. J. T. Wheeler gave a very interesting talk on bird life in relation to the forests. The talks of Mrs. M. E. Judd of Dalton, Mr. L. I. Barrett of the Southern Appalachian Experiment Station of Asheville, Mr. B. M. Lufburrow, State Forester, and Professor G. D. Markworth, head of the Georgia Forest School, dealt with the forest problems of today. Representative E. B. Dykes of the Georgia Legislature, and Bonnell H. Stone, Secretary of the Georgia Forestry Association, gave a picture of the political side of the forestry game. Mr. E. B. Stone, Jr., gave a very interesting lecture on the Appalachian Trail and the work of the organized Trail Clubs in eastern North America.

Interesting and instructive motion pictures from the U. S. Department of Agriculture were shown to the group almost



Group of the "Forestry Gang" at Young Harris College—Students, Vocational Teachers, Forestry Notables with Some of the Ladies of the Party in Background.

SIXTH DISTRICT Jack Thurmond, District Forester Savannah

Membership in Long County T. P. O. Increases.

When the Long County T. P. O. was organized on May 12, 1931, Mr. T. D. Houston was elected Sec.-Treas. of the Organization and since then has been active in visiting landowners and explaining the details of the Organization to them.

Mr. Houston says that interest in the work is good and that at the next meeting all details will be gone over with the new members and work started about October 15th. If the membership grows as expected between now and the time work begins the Organization will be able to operate at a minimum cost as provided for in the budget.

Patrolman Stafford Sees Fire Protection Profitable in Liberty County.

W. I. Stafford, Secretary-Treasurer of Liberty County T. P. O., says:

"It will soon be time to begin building fire-breaks on our protected area in Liberty county. We have not as yet enlisted as many new members as we expected to before the beginning of another year, but many have expressed their desire to join and will no doubt come into the organization when the protective work gets under way in October.

"Some timbermen are buying new tracts of land every year and are not doing anything to protect it from fire. This is not a good business practice, as a small area of well stocked timber land is more desirable and profitable than an area twice its size that is allowed to burn off each

year and supports only a good crop of gallberry and palmetto. There is absolutely no prospect of such land bringing its owner much money, whereas, with just a small outlay of money or just a few cents per acre, what is there that promises more 20 years from now? Of course the man that grows the timber may not be on hand at the harvesting, but the trees will be there; the same rule applies to a crop of corn or any other crop that is planted and worked, only timber takes a little longer to return a revenue but will do so with much less expense.

"Keeping fire out of the woods is looked upon as a mighty hard job by lots of us, who are dodging hard jobs. We are looking for the soft easy places, but, fellows, the worth while things are not to be had by following the easiest trail. All landowners will tell you that they want timber to grow on their land and will admit that it will re-seed and grow if fire is kept off and still refuse to sign up in an organization.

"We protect our fences and fields by plowing and cleaning around them, our turpentine trees by raking around them and we accuse our neighbor of laziness who neglects this duty. Now plowing and burning out fire-breaks and otherwise protecting our timber, both small and large, is just as much our duty. We Southern people are in the habit of taking life too easy, we hope that things will just happen so, and go on from day to day waiting for it to happen, and this sort of business yields no profit, for a sowing must precede a reaping. Let's put our trust more in cause and effect and get something done. In 15 to 20 years, protected timber will begin to yield. We cannot tell at this time what it will be worth in dollars and cents but we know that the tim-



Group of Forestry Students on Fire Tower Top of Enotah Mountain, Highest Peak of Georgia.

very night of camp.

Such a diversified and instructive program of work during the three weeks camp at Young Harris has attracted nation wide attention.

C. N. Elliott.

ber will be there and ready to use if conditions are normal.

"Trees have been good friends of man, but man has not learned to be a friend of the forest, although he has made millions of dollars from its products.

"Good times are surely coming again so join the Liberty County, T. P. O. and let's grow a crop of timber so that we can take advantage of our opportunity."

Another Timber Farmer.

Mr. A. Rahn of Glennville, Tattnall County, Georgia, has planted 15 acres or about 10,000 Slash Pine seedlings last winter in an old field using two year old wild seedlings pulled up in the nearby woods.

These trees were planted in rows after the ground had been prepared by throwing up a small bed with water furrows on each side, which is necessary in South Georgia to prevent water from standing around the young trees and baking upon drying out. They also act as water furrows in holding moisture during dry periods, and tend to keep weeds down until the young trees get a start.

Mr. Rahn is very enthusiastic about planting and growing timber for a profit. He plowed out the plantation this spring and the trees have grown three feet in height this summer. Many of his neighbors have taken up the work only on a smaller scale, and are all believers in growing timber as a crop for a profit.

FIRST DISTRICT

W. D. Young, District Forester,
Rome.

New T. P. O. Formed in North Georgia

A new timber protective organization has been created in north west Georgia on Lookout Mountain and will be known as the Lookout Mountain Timber Protective Organization.

The land under protection is situated in Chattooga and Walker Counties.

Officers of the TPO are, H. H. Pound, President, W. T. Ledbetter Sec.-Treas., O. C. Green, Patrolman.

Several landowners have joined the organization which brings the total land under protection up to 12,500 acres. The protection budget calls for purchase of a fire truck and fire equipment, tools, etc.

The officers of the organization are thoroughly convinced of the need of forest protection and hope to keep fire losses down to the minimum.

The first round of school forest demonstrations by staff of the Georgia Forest Service will begin in September. Some new schools will be listed this year.

STATE FOREST PARKS ATTRACT VISITORS

Improvements Add to Convenience and Enjoyment of Recreational Centers — Camping and Hiking Popular.

A large number of people have been visiting the Vogel and Indian Springs forest parks this summer. With the approach of vacation time tourists from many States have visited these areas, as well as people from all sections of Georgia.

The Vogel State Forest Park has been the focal point for visitors to the mountains, and many automobile parties have stopped there to take in the view and hike over the trails. Numbers of parties have camped within the area for periods varying from one night to one week. The unusually warm weather has made this especially appealing on account of the comfortable temperatures found at this high elevation. Elevations within the park range from 2800 to nearly 4500 feet, and all sections have been made easily accessible by well developed system of trails. Saturdays and Sundays have found large numbers of people on these areas.

The new improvements at Indian Springs have greatly added to the attractiveness of this park, and this has resulted in an increasingly large number of visitors. More than 3,000 people have visited the area in one day. They come as individuals, family groups or members of Sunday School picnics or other organized parties. A trail system has recently been complete which is an added attraction, as well as the installation of numerous seats and tables where lunches may be served.

From the manner in which these two forest parks have been used, it is evident that there is a real demand for public owned areas of this type and this demand will no doubt increase with the construction of more improved roads.

E. B. Stone, Jr., Assistant
State Forester

Praises For Forest Camp

"The Forestry Department and Vocational Department deserve a great deal of credit. Untold benefit will be derived from the forestry camp. All in all, I think the Forestry Camp should go down in history as a wonderful step toward reaching the entire state with a forestry program."—F. B. White, teacher, Georgia Industrial College, Barnesville.



"I never saw a finer set of boys than attended the forestry camp. Their conduct was exceptionally good."—President T. J. Lance, Young Harris College.

TREE-A-MONTH Striped Maple

by

C. N. Elliott

In any list of useful and beautiful trees, the maples hold a prominent place. The Sugar Maple yields a sweet sap which is made into syrup and sugar. The Norway Maple and Sycamore Maple are highly prized as shade trees. Many of the maples produce wood valuable for furniture, flooring and turnery.

One of the least valuable maples and yet one that attracts me most is the Pennsylvania Striped Maple. I had a chance to become acquainted with this tree during this summer and to study it in its natural habitat.



Striped Maple, Shy Tree of Mountains.

I was in a high cove on the slopes of the Blue Ridge one afternoon and noticed a small, brightly colored tree trunk on a rock cliff above me. After scrambling up the slope to study it more closely, I saw that it had leaves very much like the raspberry in texture and shaped like the red maple. Its bark was a combination of green and brown with white streaks. The tree was small in stature.

The Striped Maple grows in shady cove high up on the mountain sides. The guide books speak of this tree as rare in the mountains of northern Georgia, yet I found them plentifully scattered but always growing in the most secluded spots.

I became so fond of this bashful little tree that I always looked for it on my visits to the Blue Ridge slopes.

GEORGIA FOREST LOOKOUT

Volume 1

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Number 10

HONEY A PRODUCT OF ROUGH WOODS

Bees Robbed of Materials for Making Honey in South Georgia by Fires Burning Gallberry and Huckleberry.

Honey is one of the products of the forest that is dependent on many flowering shrubs found in woods. If fire is kept out of the woods maximum production will result and bring to foresters who keep bees considerable cash.

Gallberry, which has become the symbol of rough woods in south Georgia, furnishes some of the finest honey made. According to Hamp Mizelle, naturalist and fire patrolman living on the edge of the Okefenokee swamp, there are four principal honey "flows". In early spring, huckleberry flowers furnish the nectar. This flow is followed by the black gum and tupelo flows, with gallberry coming in the middle of May.

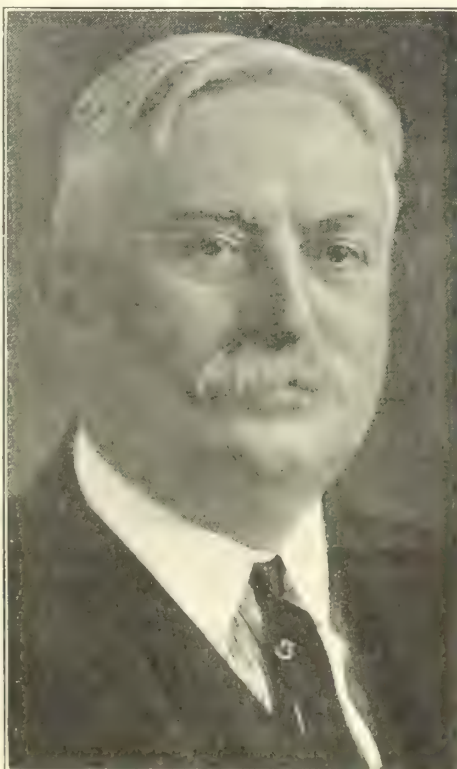
Hamp states that one land lot (490 acres) protected from fire will support 100 hives of bees, but that on land burned annually, several land lots are required to furnish as much "grazing" for the bees. During the last season, Hamp harvested 5,000 pounds of honey from 212 hives. Most of this he sold in one lot at 10 cents a pound. This is just another one of the many examples of what sources of income are to be found on wild land when fire is kept out.—C. Bernard Beale, District Forester.

Georgia is first in forested area of any state in the Union, having over 23,000,000 acres in forest and potential forest land; and is second in the number of species of trees, being preceded only by Florida.

JOSEPH A. McCORD FORESTRY PIONEER

Leading Business Man Who Saw the Vision of Forestry and Has Served Faithfully and Well in Promoting This Great Natural Resource of Georgia.

Prominent businessmen of Georgia have visualized the meaning of forestry in the development of the potential wealth of the state. Among the business leaders of the state who have taken a prominent part in the councils of those directing a program of forestry in Georgia is Joseph A. McCord, of Atlanta. He has been an
(Concluded on page 2, col. 1)



JOSEPH A. McCORD
Pioneer in Forestry of Georgia.

BLACK LOCUST RESULTS— PLANTING FROM SPROUTS

Results Obtained by Dr. Neal Kitchens, Warm Springs, Ga.—Phenomenal Growth—Excellent Fence Post Material.

A black locust tree 30 ft. high and 6 in. D. B. H., planted from two year nursery stock only two and one-half years ago! It is a fact, and a most important one considering its commercial possibilities and its uses about the farm for fence posts, etc., where a durable wood in contact with soil is needed.

In the early spring of 1925, Dr. Neal Kitchens of Warm Springs, Georgia, planted fifty small black locust seedlings on a 30 x 40 ft. plot in his back yard. Fire, which a small boy carelessly set, burned through this plot of black locust seedlings the following winter and killed practically the entire lot. Here is the result: Large numbers of black locust sprouts sprang up the spring following the winter in which fire burned over the plot. In 1929, Dr. Kitchens planted two-hundred sprouts from this plot, and in 1931 he was able to secure one-hundred and fifty sprouts that had sprouted following the grubbing up of the trees in 1929. This same plot is now covered with sprouts from which he expects to plant one-hundred and fifty or more black locust plants in 1933.

Facts derived from the above are as follows: 1. Black locust readily sprouts from the roots left in the ground following the grubbing up of planting stock, which sprouting ability automatically does away with planting of seed each year. 2. Planting stock of two years age gives best results.

Why use two year old planting stock? That question introduces the secret to securing such remarkable growth. Dr. Kitch-

(Concluded on page 2, col. 2)

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Joseph A. McCord—Cont'd

officer and a member of the executive committee of the Georgia Forestry Association from its inception. None has served more faithfully. His wide experience and his sound judgment have made his services of great value.

Mr. McCord has been associated with the banking interests of Georgia for many years, president of a leading bank of Atlanta, as head of the Federal Reserve Bank and identified with other prominent financial interests.

It is with pleasure that the Georgia Forest Lookout places Mr. Joseph A. McCord in its gallery of notable pioneers in forestry in Georgia.

Trend of Lumber Production in Georgia

While the production of lumber varies with building demands, Georgia's lumber production in recent years, not including 1930, is fairly constant.

Production statistics are as follows. For 1924, 1,206,599,000 board feet; 1929, 1,386,250,000 board feet.

Referring back to 1909, we find production was 1,342,249,000 board feet.

According to the census, 1,692 saw mills were operating in 1929, of which number 1,284 mills cut in excess of 200,000 board feet annually. Small mills cutting less than 200,000 board feet annually produced only 48,175,000 board feet.

Black Locust—Cont'd

ens "tops" all of his stock back to a uniform length of five feet when planted. The sprout will, of necessity, have to be more than one year old to have height growth enough to allow "topping" at proper height. This topping causes the tree to branch out and thus concentrate growth in a short trunk of selected height, thereby giving a single post of sufficient diameter within a period of from two to four years following planting.

Dr. Kitchens is making it a practice to plant a black locust beside each post in his pasture, the idea in mind being to supplant the present posts with black locust posts as needed. In order to prevent the wire from being enveloped by the growth of the trees used as posts, a 2 x 4 in. galvanized iron plate is placed horizontally between the wire and tree. The wire is held in place by two nails, one of which is driven through the plate and bended over the wire, the other nail being driven through the plate on the opposite side of the wire and bended over the other nail. This is to facilitate pulling out the nails and changing position of plate to prevent injury to trees.

W. G. Wallace, District Forester.

PRUNING LOBLOLLY

PINES RECOMMENDED

Value of Lumber Increased by Pruning Shown by Tests Reported by Forest Products Laboratory of United States Forest Service.

The Forest Products Laboratory of the United States Forest Service at Madison, Wisconsin, recently released an article discussing the advisability of pruning young stands of loblolly pine. From studies made in North Carolina and Louisiana, it is stated that by pruning, the value of the lumber would be increased from two to four times. Experiments in North Carolina showed that by pruning trees fifteen years old up to sixteen feet above the ground, the value of the timber at fifty or sixty years of age would be increased \$180 to \$250 per acre.

In a Louisiana stand of loblolly the net increase of return per acre of trees that had been pruned over one that had not been pruned was almost one hundred dollars!

The article advocated the method of pruning to all loblolly pine growers and suggested that some tool might be patterned to facilitate pruning large limbs sixteen feet from the ground.

SIXTH DISTRICT

Jack Thurmond, District Forester
Savannah

Long County T. P. O. Holds Meeting.

On September 10, a meeting was held in the county courthouse in Ludowice, Georgia, at which several new members were taken into the Long County T. P. O. T. L. Howard, president of the organization, presided at the meeting and a discussion of the work to be done during the coming fall and winter was the principal business to come up.

C. A. Nobles, with 1200 acres of timber land adjoining lands already included in the organization, was admitted and Harry Parker, with 500 acres, was also taken in. This addition acreage brings the total for the T. P. O. up to 15,000.

T. D. Houston, secretary-treasurer of the organization, has been active in putting the plans of the organization before the landowners and in getting new members to come in and take up the work. Another meeting will be held in the courthouse on October 2, at which time all details will be gone over relative to getting started with firebreak work on or about October 20. All landowners who desire to be taken into the organization this year should see Mr. Houston and be present at the meeting before all budgets and assessments are closed and unless listed, one will have to wait until next spring before being listed as an active member.

W. I. Stafford's Comments on Benefits From Fire Protection in Liberty County.

"I want to ask the landowners and all citizens interested in the welfare of our county if they, in passing along, have taken time to notice the growth of the timber both old and young where the woods were kept rough last year or for the last two years, and then have turned and observed the burned woods closely? Which looked the most thrifty?

"In my section I see other things besides timber on the rough woods. In huckleberry time the protected woods are blue with berries but there are none on the burned woods. The low-bush live oak which furnishes abundant hog feed from their acorns are plentiful on the rough woods and will fatten many piney woods hogs this fall, while if burned the bushes fail to bear. The berries and acorns alone, if properly utilized, will pay the taxes on the land and the cost of fire protection.

"As much of the land in Liberty county outside of the organization burned over last year, you will not have any trouble in seeing the difference in the burned woods and lands that were listed in the Liberty County T. P. O. and protected.

"We are now passing through one of the worst periods that this country has ever known and if we ever needed to practice thrift it is now. Some of us think that to deposit a little money in the bank each week is thrift, and it is; but to protect and build our timber lands up to higher producing standards is also thrift. The sooner we learn to help ourselves and put all our acres to producing something, the sooner we will stop having to ask for help to get us out of the tight places that our don't-care habits have gotten us into.

"The Liberty County T. P. O. heartily requests every good citizen in Liberty county (and every one of us is just chock full of goodness) to assist in every way possible to help us keep fires out of the woods and bring better times to our county. If you will but look into the future 10 to 15 years from now, our boys and girls will be the men and women of tomorrow, living on a higher plane and needing timber just as bad as we do now and maybe needing a better supply of raw material even worse than we do, you will see that we need to get together and protect the timber and give it a chance to grow so that every idle and unproductive acre will begin to yield a revenue.

"Restocking can be had by joining the Liberty County T. P. O. and keeping the fire off of the land. Keeping fires down is a job for each and every citizen of the county working through a cooperative organization such as we now have in the county. Remember that a fire not started is better than one started and then put out, or in other words, an ounce of prevention is better than a pound of cure." —W. I. Stafford, Sec.-Treas. and Patrolman.

School Forest Prize for 1932 Sought By Soperton High School.

Students taking vocational forestry at the Soperton High School have already perfected plans for making a strong bid for the 1932 prize given each year to the school doing the most outstanding work in forestry.

Last year they planted 5 acres to slash pine, or about 2,500 seedlings. This year they intend to double the number of seedlings planted and to do work on the forest such as thinning, pruning and all other work outlined by the Georgia Forest Service. Each boy also plans to do the same work on a home project.

The school forest at Soperton is possibly the only one in the state which was established on an area where the timber was practically all planted. The forest is situated on the first planting that was done by James Fowler in 1925 and is now 18 to 20 feet high and from 4 to 6 inches in diameter, and, after the ten-year period has expired, will be just about ready to uprooting.



Part of Student Group at Forestry Camp Studying Trees.

VOCATIONAL TEACHERS PRAISE FOREST CAMP

Value of Camp Rated High—Instruction Considered Well Adapted to High School Students.

A number of vocational agricultural teachers who attended the forestry camp at Young Harris College and assisted in management were sent a questionnaire asking their opinion of the courses offered and various questions about the general program, including excursions, etc.

The consensus of opinion was that the courses presented were well suited to students of high school grades and that the methods of presenting the subject were thorough and practical.

From the general comments of a number of the teachers the following are taken:

F. B. White, Barnesville: "I think it was a wonderful camp and was helped very much."

W. L. Green, Eastanollee: "I don't remember a time that I enjoyed more and at the same time gained something that will be of immediate value to me."

W. B. Bates, Nashville: "I think the course was very good and not too hard."

L. E. Cox, Epworth: "I believe that the school was a success. No criticisms to offer."

A. R. Bennett, Madison: "I think that the camp should be continued every year. It is fine for both student and vocational teachers."

R. D. Pulliam, Soperton: "In my opinion the camp was very much worth while, and I expect good results to come from the work done there."

K. N. Phillips, Royston: "I think the camp was very good. I learned lots about forestry I think will help me in my teaching."

C. R. Hazen, Adel: "I enjoyed the camp immensely and derived a great deal of benefit from the instruction. It was well generated."

R. E. Tanner, Summit: "The camp was well planned, nicely managed and served its mission to perfection."

Clovis Turk, Sale City: "I want to say that I am very much gratified with the forest camp. I believe it is a fine thing and will develop real foresters."

SEVENTH DISTRICT C. Bernard Beale, District Forester Waycross

Pulpwood Furnished for Printing "Georgia Magazine"

A. K. Sessoms, Cogdell, Georgia, forestry board member, and pioneer in timber growing, has loaded a car of pulpwood to be shipped to the U. S. Forest Products Laboratory at Madison, Wis., where it will be manufactured into paper for printing the next edition of the Georgia Magazine.

F. H. Abbott, Waycross, Georgia, editor of the Georgia Magazine, will chronicle the development of the paper mill idea in Georgia in this edition. Beginning with the first efforts of Dr. Chas. H. Herty, he

will outline the events leading up to the recent appropriation by the state legislature for an experimental pulp plant, which will be under the direction of Dr. Herty, with the cooperation of the Georgia Forest Service.

Heavy Crop of Pine Mast

An excellent seed crop of both long-leaf and slash pine is in store for southeast Georgia. Because of their abundance, cones will be easy to collect this year. Many landowners are preparing to collect seed with a view to planting a seedbed in order to have seedlings for transplanting next year.

Highest Student Grades at Vocational Forest Camp

Grades obtained by students attending the vocational forestry camp during the summer averaged fairly high. Vocational teachers who took the examinations received the highest grades. The names of students averaging the highest grades in the five subjects on which they were examined and their addresses are as follows:

Harry Seymour, Bowman	95
Bill Seaman, Waycross	95
Horace Ayres, Carrollton	92
Howard Carlan, Commerce	91
Ralph Watson, Moultrie	90
Claxton Buren, Kite	90
Broadus Orr, Flowery Branch	90
Fulton Morey, Sale City	89
Marvin Lloyd, Chamblee	88
Herman Tyson, Sycamore	88
Merrill Boyd, Fairburn	88

Gathering Pine Seed

This is the time of the year when tree seed should be collected. Pine seed are mature and if burs are not harvested before the first of October, they will open and let the seed fly away.

The burs may not be thoroughly brown and may still have a greenish cast, but this does not mean that the seed are not mature.

The best way to gather pine seed is to go where trees are being cut for a saw mill and gather cones from the tree tops. Pines do not mature seed every year. Pick the large cones that have just matured. Some pines hold their old cones that have already lost their seed, which, of course, should be ignored.

If the cones are gathered in bags, such as have been used for grain or fertilizers, they may be kept in these containers until the time to shake the seed loose from the cones.

Placed in a dry place the cones will dry out and open up in a few weeks. One can then beat the sack and the seed will fall out of the cones into the sack.

Rub the wings from the seed and then store the seed in a dry place away from rats and mice. Planting in the seed bed may be made in late winter or early spring.

OLDEST PLANTATION OF GEORGIA PINES

Over 500 Board Feet Per Acre a Year
for Thirty-Five Years—Rate of
Growth Increases.

Probably the oldest forest planting in Georgia, and incidentally, one of the oldest in the South, is located near the city of Griffin in Spalding county, Georgia.

The planting is a mixture of loblolly and shortleaf pines, offering a very beautiful scene to the observer.

Increment borings show the stand to be about 35 years of age. The stand is fairly consistent throughout the entire planted area and is a good example of what can be expected from a systematic planting of pines.

A recent timber cruise of the tract shows 17,544 board feet of pine and 1500 board feet of red gum to the acre. This is an average yearly growth of 544 board feet for the 35 year period since planting.

The present annual growth is at a still more rapid rate and the ultimate yield per acre in this stand will be very heavy.

This plantation shows what may be expected of similar plantings.

E. B. Stone, Jr., Assistant State Forester.

Building Cabins on School Forests

Rural vocational high schools of the state are interested in building cabin club houses on their school forests. Three or four schools already have their club houses and find them very popular. Not only are the cabins used for forestry work, but as meeting places for the Future Farmers of Georgia clubs.

The preference thus far has been for log cabins with chinkings of clay mud. In regions where clay is not to be found, slabs are used to cover crevices between logs.

Whether chimneys should be erected or stone ovens of the camp type set up under a camp shed is a mooted question.

The Georgia Forest Service contemplates getting out plans for a cabin. Anybody with suggestions is invited to send them in. Plans and specifications will be sent out as soon as suggestions are made. Send in your suggestions at once.

T. P. O.'s In Process of Formation.

Plans are being shaped up for the formation of three additional timber protective organizations in southeast Georgia.

The areas on which efforts are being made to introduce organized fire control are centered around Kinderloun in eastern Lowndes county, Ray City and Poplar Springs in Berrien county, and in the "bend" region of south Charlton county.

TREE-A-MONTH

Cypress

by

C. N. ELLIOTT

The tree in our state that has perhaps the oldest family record is the Cypress. It was among the first trees to show annual rings. Its beginning dates back many millions of years to the geological Jurassic period, at which time the Sequoia and Ginkgo trees were also growing.

The home of the Cypress in Georgia is the swamps in the southern part of the state. Growing in the water it must have root projections or "cypress knees" through which it gets the additional air needed for its roots and under-water parts.



The Cypress belongs to the Pine family. It is the only representative of that family in Georgia that sheds its leaves in the fall and remains bare throughout the winter. Its needles are broader than those of the yellow pine and flatter. They are so arranged as to give the twigs a flattened appearance.

The wood of this species is very durable and highly desirable as lumber. Cypress shingles are much in demand. The wood is light, soft, not strong and is very easily worked. It does not rot readily in contact with the soil and is much desired for poles and piling.

Like the alligator and snake bird, the Cypress is a remnant of ancient life that has been pushed back in the struggle for existence to a common habitat, the southern swamp. The Cypress is the best tree product of the watery waste lands.

Cawley Goes to Jenkins

County Agent L. V. Cawley, who has been secretary of the Brantley T. P. O., has been transferred from Brantley to Jenkins county. Mr. Cawley has been very enthusiastic in developing fire protection and better forest practice in Brantley county, and his removal will be a distinct loss to the cause of fire protection in that county.

GEORGIA FOREST LOOKOUT

Volume 1

ATLANTA, GA., NOVEMBER, 1931

Number 11

ANNUAL SESSION STATE FORESTERS

Program Will Be Conducted November 16-19 at Various Points in Georgia and Florida as Foresters Conduct Tour of Inspection.

With the Georgia Forest Service and the Florida Forest Service as hosts, the state foresters of the United States will hold their twelfth annual meeting November 16-19 with itinerant sessions beginning at Savannah, Georgia and concluding at Jacksonville, Florida.

Last year the state foresters met on the Pacific coast. This year it is held in the southern pine belt where naval stores are among the forest products.

Program at Savannah

The session will begin with a breakfast program at Savannah where the Georgia State Board of Forestry will be host and John Wilson, Secretary of State, will preside as the delegates hear welcome addresses from Governor Richard B. Russell, Jr., for the state; Judge Gordon Saussey for Savannah and T. G. Woolford for the Georgia Forestry Association. After a response by E. O. Siecke, state forester of Texas, and president of the Association of State Foresters, the party will board buses, visit interesting and historic spots in Savannah and start on a forest inspection trip of two states.

A brief visit will be made at the Bamboo Experiment Station of the United States Department of Agriculture near Savannah, and a short stop will be made at Old Midway church and note will be made there of the wooden grave marker dated 1770—still sound—also the magnificent specimen of a moss-draped live oak.

At Brunswick a study will be made of wood utilization as demonstrated by the Hercules Powder Company plant where pine stumps are being converted into tur-

(Continued on page 2, column 1)

J. F. Hart, Pioneer Georgia Forestry

J. F. Hart, better known as "Jack" Hart, of Dublin, Georgia, was among those who first actively espoused the cause of forestry in Georgia and helped to form the Georgia Forestry Association. Mr. Hart is a graduate of the University of Georgia and was formerly a member of the faculty of the Georgia State College of Agriculture, but for many years he has been a leading county agent with headquarters at Dublin, near which city he owns a farm.

Mr. Hart's ability, culture, earnestness, enthusiasm, associated with the qualities of a southern gentleman, make him a constructive influence for good. Laurens county is justly proud of him and the forestry interests of Georgia are pleased to count him among those who have labored in their behalf. It is with pleasure that he is placed in the gallery of forestry pioneers of Georgia.



J. F. HART, DUBLIN. PIONEER
IN GEORGIA FORESTRY

GEORGIA'S TIMBER RESOURCES ESTIMATED

**Largest Timbered Area of Any State
—Wide Variety of Trees With
Pines Providing Chief Forest In-
come.**

A recent estimate of timber resources of Georgia has been made, which according to the Georgia Forest Service, is only an approximation and not an absolute figure.

The original forest area of the state, according to the estimate, was 36,480,000 acres, with the present commercial forest area at 22,872,000 acres, of which 1,150,000 acres are old timber, 20,143,000 acres as second-growth and 1,579,000 as forest land not restocking.

The report classified the forests of Georgia into five general types, according to mixtures of tree species, as follows: Oak-chestnut-yellow poplar; oak-pine; short leaf-loblolly pines-hardwoods; longleaf-slash pines; riverbottom hardwoods-cypress.

The longleaf-slash pine type is the largest with 10,815,000 acres and the short-leaf-loblolly pines-hardwood type is second with 8,178,000 acres; oak-pine 2,069,000 acres; riverbottom hardwood-cypress 1,200,000 acres and oak-chestnut-yellow poplar 610,000 acres.

Total present sawtimber area is estimated at 6,900,000 acres, cordwood production area 7,566,000 acres; area restocking 6,827,000 acres and non-restocking area 1,579,000 acres. The largest available sawtimber is reported for the shortleaf-loblolly pines-hardwood type amounting to 11,695,000,000 board feet; longleaf-slash second with 4,743,000,000 board feet; riverbottoms third with 2,280,000,000 board feet; oak-pine 1,520,000,000 board feet and oak-chestnut-yellow poplar 632,000,000 board feet. In this esti-

(Continued on page 2, column 3)

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Session State Foresters—Cont'd

pentine, rosin, pine oil and packing fiber. The plant of the Georgia Creosoting Company will be inspected to observe wood preservation practices. Historic trees like the Wesley oak and Lanier oak and historic places will be seen.

In the late afternoon the party will reach Waycross where the program will be resumed at night.

Program at Waycross

President Siecke will deliver the annual address. Paul Chapman, director of vocational education in Georgia, will tell of the forestry work with rural vocational schools in Georgia. "Forestry in Hawaii" will be the subject of a talk by C. S. Judd, chief forester of Hawaii. Fred B. Merrill, state forester of Mississippi, will talk on forest fire and its relation to longleaf pine reproduction, and E. L. Demmon, director of the Southern Forest Experiment Station, New Orleans, will lead in the discussion.

Starting early on November 17, the foresters will visit Cogdell and the Timber Products Company, a large private operation. A steam turpentine still, fire tower and results of fire protection on growth of young trees, will be observed.

In the afternoon the party will arrive at Fargo, field headquarters of the Superior Pine Products Company, with holdings of 225,000 acres and where Captain I. F. Eldredge, forester, is directing a program of scientific reforestation, forest management, fire protection and utilization.

Program at Jacksonville

On to Jacksonville at night. A night session will be held at the Washington hotel. The topic for discussion will be "Fac-

tors Pertaining to Federal Cooperative Projects", discussed by Fred Morrell, chief of Public Relations of the United States Forest Service, and A. B. Hastings, assistant chief.

Starting at 9 o'clock the party will move by bus and automobiles westward, observing the Osceola national forest, the Olustee fire tower and battleground and the new experimental laboratory of the United States Bureau of Chemistry and Soils, established for research in naval stores production.

Four miles east of Lake City at a turpentine still, brief talks will be made by E. L. Demmon, George P. Shingler and H. L. Baker. The still, in operation, will be explained by Messrs. McCloskey and Gregory.

A visit will be made to the state forest nursery at Raiford and a stop will be made at Starke where a branch of the Southern Forest Experiment Station is located. Lenthall Wyman will explain the work in naval stores research carried on there.

Between Starke and Ocala, a demonstration in firebreak construction and fire fighting will be given by the Florida Forest Service.

Ocala Program

At Ocala a business program will be conducted, consisting of reports of committees and election of officers.

After the business meeting the party will visit the famous Silver Springs and view its aquatic wonders through glass bottom boats. The party will then travel through Florida's citrus belt eastward to Daytona, to view the famous beach where world auto speed records have been made.

The next stop will be St. Augustine, the oldest city in the United States. After an inspection of historic scenes, the foresters will reach Jacksonville, and that ends the 12th annual session.

THE SENTINEL PINE

My roots feed deep in rocks;
 I resist the tempest's shocks;
 Full strength I freely give
 To bless my time and live
 And yield the world my very best—
 If only man, a friend,
 Would help attain that end.
 Keep fire and axe away,
 Help us in every way—
 Not treat us as a pest.

Oh, why will man not learn
 The years it takes for our return?
 When fire brings dearth to earth,
 Sparing no trees at birth—
 Is man without concern?
 Why destroy us—and himself,
 Beauty, wealth, soil and health?
 See that stub—all that's left
 Of my princely brother's heft—
 Why will man never learn?

—By W. T. Carden, Tax Receiver,
 Floyd County.

(Continued from page 1, column 3)
 mate of available sawtimber, 14,817,000,000 board feet are placed as softwood and 6,053,000,000 board feet as hardwood.

The rank of forest type and amount of available cordwood in each are reported as follows: shortleaf-loblolly pines-hardwood forests 36,792,000 cords; longleaf-slash 34,065,000 cords; oak-pine 8,016,000 cords; riverbottoms 7,200,000 cords; oak-chestnut-yellow poplar 1,080,000 cords.

The total estimated yields of softwood are 66,732,000 cords and of hardwoods 20,421,000 cords. If sawtimber is included as available cordwoods, the total available would be 128,107,000 cords. In either case, it is apparent that Georgia has a large supply available of pulpwood.

Southern Appalachian Region Offers Big Field in Forestry

Farms, mills, and industries of the southern Appalachian region should always be able to get plenty of timber from local forests, but it will require the practice of good forestry to keep this region continuously self-supporting in timber, says the Forest Service. This, in turn, will require the general cooperation of owners of forest lands. Only about 3 percent of the potential forest area of 60,000,000 acres in the southern Appalachian region is in national forests. Virgin stands probably aggregate less than 2,000,000 acres, and much of the remaining forest land has been culled repeatedly and burned over. The large sawmills of the past are being superseded by the small portable mill in this region, and the present tendency of the small mill is to strip the woods of everything. This practice must stop, and the landowner and the small-mill owner must join in the practice of better forestry, gradually putting timber on a regular crop basis, otherwise the potentially valuable mixed hardwood, pine, and spruce forests of the region will revert to brush and insolvency.

Approximately 30 percent of the southern Appalachian hardwoods are suitable for paper pulp. Systematic use of many forest trees and products by a combination of lumber, pulp, and other forest products operations will aid in harvesting the timber crop without depletion of the reservoir of growing stock.

Forestry Exhibit at Columbus Fair

A forestry exhibit was displayed at the Chattahoochee Valley Exposition held at Columbus, Georgia, on October 12-14. District Forester W. G. Wallace, Columbus, arranged the exhibit material which consisted of panels illustrating the work of the Georgia Forest Service and exhibits featuring the importance of fire protection, reforestation and forest management.

DISTRICT ONE

**W. D. Young, District Forester,
Rome, Georgia**

A new demonstration forest will be established at Blackwell Consolidated School near Marietta in Cobb county. Mr. W. M. Putney the vocational teacher who comes to this school this year, is very enthusiastic over the prospects of a good school forest project.

Rome Radio and Forestry

The officials of the Rome radio station, WFDV, have stated that they would be glad to have the district forester give a series of talks on forestry and fire prevention over the radio this fall, one of which talks has already been put on the air.

New T. P. O. Equipment

New fire tool equipment is being acquired by the various T. P. O.'s in District 1 this fall in preparation for the coming fire season. Two of the organizations contemplate equipping trucks with water tanks and other equipment for use in fire suppression.

SIXTH DISTRICT

**Jack Thurmond, District Forester,
Savannah**

Liberty County T. P. O. Holds Meeting

The Secretary-Treasurer of the Liberty County T. P. O. called a meeting of all members and timber-land owners for Thursday October 1, 1931, at 8 P. M. Those present included Mr. R. L. Rahn, Mr. J. B. Frasier, Mr. H. L. Stacey, Mr. Robert Irvin and the local District Forester. The election of new officers was the first business to be taken up. Mr. J. B. Frasier of the Frasier Lumber Company was re-elected President of the organization. Mr. Robert Irvin of the Savannah River Lumber Company was elected Vice-President, succeeding Mr. R. L. Rahn and Mr. W. I. Stafford was re-elected Secretary-Treasurer and Patrolman.

It was decided to try fire-break construction work this year with two-horse turning plows and also to try out a Fordson tractor with a side plow in getting furrows plowed preparatory to burning out the strip. Actual work on firebreak construction was ordered to begin on October 15.

The Secretary-Treasurer was instructed to make out notices for assessments due and mail them out immediately. The budgeted cost for protection, including all fire-breaks, equipment, and salary for Pa-

trolman, amounted to 5.5 cents per acre, but due to conditions it was decided to call for assessments of only 2 cents at this time.

One hundred cloth fire signs will be bought by the organization and put up around the boundary of all the protected land calling the attention of the public to the fact that the land behind the signs is under protection and what the results are expected to be.

All members were enthusiastic and very much pleased with the showing made by the organization. The addition of many new members and the feeling that the work is showing results, are encouraging the organization to go forward.

Vocational Schools Visited

Demonstrations in Fire Protection, Tree Identification, Estimating Standing Timber and Seed Collection were given by the District Forester this fall at the following schools: Brooklet, Emanuel County Institute, Adrian, Soperton, Vidalia Center Consolidated, Lyons and Marvin Yancey.

Interest is running high among the students and every school is working hard to get lots of work done so that they will have a chance at the prize next year. Every school has collected cones from which to extract their own seed so that they can plant seed beds this coming spring.

Long County T. P. O. Holds Meeting

A meeting of the Long T. P. O. was held on October 2nd, at 8 P. M. in the County Court House in Ludowici, Ga. Those present included Mr. T. L. Howard, President, Mr. Jim Parker, Secretary-Treasurer, Mr. Clyde Chapman, Vice President, Mr. C. A. Nobles, Mr. C. A. Sallette, Mr. Henry Parker, Mr. Harry Parker and Mr. Gordon Nessmith the local vocational teacher. Plans were perfected to begin work on October 15th. The secretary-treasurer has the authority to hire the patrolman and supervise the work. As this is the first year the Long county T. P. O. has existed interest is keen and the landowners are very anxious to make a good showing.

Farm Forestry Pays

One-third of all farms in the United States yield as much as \$220 worth of timber per year, the United States Department of Agriculture says. An exhibit from the Forest Service shows that the annual farm forest crop is worth \$395,000,000. Timber not only pays in dollars and cents, but it is like a bank account upon which the owner can draw in times of stress. Its uses range from farm buildings, telephone poles, repairs, and fuel on the farm, to saw logs, cross-ties, pulpwood, posts, and poles.

SEVENTH DISTRICT

**C. Bernard Beale, District Forester,
Waycross, Georgia**

Kinderlou and Big Bend T. P. O.'s Formed

Two additional T. P. O.'s have been formed in the seventh district. The Big Bend T. P. O. in the "Bend" region of Charlton county, embracing 35,000 acres was formed the latter part of September with the following officers:

L. Knabb, president and W. C. Hopkins, secretary-treasurer.

The plans include employment of a patrolman and construction of fire breaks.

The Kinderlou T. P. O., embracing 17,500 acres in western Lowndes county was formed October 8. The officers are:

W. H. Cotter, president; Jerry McCree, vice-president; W. T. Paine, secretary-treasurer.

The plans call for employing one patrolman beginning November 1 and fire-breaks to be constructed on some of the area. All of the area will be posted with special fire posters.

New Officers Gaskins T. P. O.

The Gaskins T. P. O. in Berrien county recently elected new officers as follows: J. L. Hughes, president; J. G. Ford, vice-president; J. Henry Gaskins, secretary-treasurer.

About 2,000 additional acres have been added to the unit's area.

Brantley T. P. O. Gets Ready for Fire Season

At a meeting of the Brantley T. P. O. at Nahunta, October 10, new officers were elected for the coming year as follows: J. T. Adams, president; W. S. Courson, vice-president; J. R. James, secretary-treasurer.

It was decided to assess 2 cents an acre for employing three patrolmen beginning probably December 1.

All landowners attending the meeting stated that their cattle were in fine shape as a result of keeping the woods rough last year. Several members plan to begin work on firebreaks at an early date.

Ray City Wants T. P. O.

At a get-together meeting at Ray City arranged by Vocational Teacher W. B. Bates and County Agent D. L. Branyon, held October 9, all who attended voiced their enthusiastic approval of a plan to have a timber protective organization in that section.

It was decided to hold another meeting October 29 at which time a timber protective organization will probably be formed.

NEW PUBLICATIONS

GEORGIA FOREST SERVICE

New publications just issued by the Georgia Forest Service include a leaflet entitled "Loblolly Pine Production" by W. D. Young, district forester; leaflet "Forest Resources of Georgia" by C. A. Whittle, director of education and utilization, and a bulletin "Planting Longleaf and Slash Pines" by H. M. Sebring, assistant state forester and Jack Thurmond, district forester.

A leaflet issued in October and distributed in south Georgia prepared by C. Bernard Beale, district forester, is entitled "Keep the Woods in the Rough".

These publications contain useful and timely information and are sent free on request to citizens of Georgia.

MODEL SCHOOL FOREST

WORTH COUNTY EXHIBIT

At the Worth county fair held October 7, 8 and 9 at Sylvester, a model school forest was exhibited. District Forester H. D. Story, Jr., George I. Martin, vocational teacher at Sylvester, and M. D. Mobley, Tifton, district supervisor of agricultural schools, cooperated in putting on the exhibit.

A miniature forest surrounded by wire fence contained plots demonstrating thinning, burned and unburned plots, tree planting, trees of proper turpentine size, selective cutting, utilization of thinnings, firebreak construction and seedbed for growing tree seedlings.

Every part of the exhibit was labeled so that the messages which the exhibit intended to convey were clear. As a result, the exhibit attracted much interest and favorable comment.

Forest Protection Effective

Forest fires in the United States last year swept over a total of more than 52 million acres—an area greater than the States of Ohio and Indiana combined—according to the annual summary of fire statistics made public today by the Forest Service, United States Department of Agriculture.

Organized protection strikingly proved its effectiveness in keeping down forest fire losses, according to the Forest Service figures. For every acre of protected land burned over, approximately eight acres of unprotected land were swept by fire, although only one-third of the forest land of the country is now without some form of organized protection. The total area of protected land burned over during the year was 5,809,320 acres, but 46,157,140 acres of unprotected land suffered from fire. Of the protected forest the area burned was less than 1½ percent.

FOREST FIRES IN THE FALL

On account of the long dry spell, conditions in the forest have been favorable for disastrous fires. A few fires have broken out and the damage in some instances has been very severe. Warnings were sent out by the Georgia Forest Service through the press of the state calling attention to the combustible nature of the forest due to the drouth and cautioning against fire.

On a 700 mile trip made through south Georgia by State Forester B. M. Lufburrow in late October, no forest fires were seen and evidence of only one fire having recently occurred was noted. It is gratifying to the state forester to note this evidence of an awakening of the public to the necessity of protecting the forests of the state.

South Georgians have been notified through the press of the fact that there is a good crop of longleaf pine mast this year which occurs only every three to six years. Burning the woods, the public was reminded, would injure the seed and prevent the natural reforestation these seed are capable of bringing about.

Herty Prizes

Dr. Charles H. Herty has offered a prize of \$100 to the rural vocational school doing the best work in forestry, \$50 to the student making the best record and \$25 to the student making the second best record in forestry.

A committee consisting of President T. G. Woolford of the Georgia Forestry Association, B. M. Lufburrow, state forester, and Paul Chapman, state director of vocational education, recently met and agreed upon the basis of award which consists of 50 percent for examinations of students in forestry, 30 percent for work on school forests and 20 percent on students' home forestry projects. The student awards will be on the basis of 50 percent for examination, 30 percent for home forestry project and 20 percent on general scholarship.

Order Seedlings From State Nursery

Those who contemplate planting pines in the later winter or early spring and intend to get planting stock from the State Tree Nursery at Athens should place their orders immediately. The nursery has only slash and longleaf pine left for sale. These are offered at \$2.50 per thousand which is the cost of growing them.

The State Tree Nursery is maintained cooperatively by the Georgia Forest Service, the United States Forest Service and the School of Forestry of the Georgia State College of Agriculture. Orders may be sent directly to the School of Forestry of the State College of Agriculture at Athens.

TREE-A-MONTH

White Oak

by

C. N. ELLIOTT

Our once extensive forests of virgin hardwood have all but disappeared under the axe of the woodsman. Massive, valuable timber trees grew in these forests, trees that were used in the building of an empire. Prominent among them was the white oak with wood so valuable commercially that we should not allow its place to be taken by less important species.

This tree grows all through the state and under almost every condition. It grows in low, swampy land, on dry lands, poor



LEAVES OF WHITE OAK

or rich lands and on high, rocky hillsides, being no larger than a shrub at altitudes of over 4,000 feet on the mountains in the northern part of the state. It thrives best in fertile soils under cool, moist conditions, attaining sometimes a height of over 100 feet with diameter of five or more feet. In the open its trunk is short with its massive branches sometimes forming a crown over 100 feet in diameter. In the forest the trunk is tall and straight with limbs more constricted.

The white oak may be recognized by its loose, scaly, light-colored bark and by its slender, tough, grayish twigs. It has smooth, lobed leaves with light-green upper surface and whitish lower surface. The leaves have rounded lobes, 5 to 9 in number with deep sinuses between.

The wood is strong, hard, heavy, durable, straight and close-grained and light brown in color. It is used in the manufacture of furniture, agricultural implements, in ship-building, for various kind of construction, tight cooperage, basketry flooring, railroad ties, etc.

GEORGIA FOREST LOOKOUT

Volume 1

ATLANTA, GA., DECEMBER, 1931

Number 12

SOUTH GEORGIA FOREST FIRES

Crucial Test Successfully Met—Timber Protective Organizations Effective in Greatest Threat Yet Confronted—Unorganized Land Owners Willing Fighters—Total Area Burned Over Only Small Percentage of Whole—Spectacular Swamp Fires Give Appearance of Wide Conflagration.

"Since forest fires have been successfully controlled during the long dry spell we have had, they can be successfully controlled at any time," says State Forester B. M. Lufburrow.

That forest fires have been successfully combatted during this crucial test is evidenced by the fact that less area has been burned over during the fall than usually occurs. A survey now being made substantiates the statement.

Many fires have broken out but realizing the great damage that fires will do to the trees during the long drouth, citizens generally have been willing fire fighters with the result that except for swamp fires, the burned area of each fire has been less than usual.

T. P. O.'s Splendid Work

Timber protective organizations have met the situation splendidly. Prompt, systematic and intelligent attacks on outbreaks have restricted the burned area to a small percentage of the whole. The timber protective organizations have been in great demand to aid in fighting fires in unorganized areas. Men and equipment have been supplied and as a result, much unorganized area has been saved, thanks to the T. P. O.'s.

(Continued on page 2, column 1)

MRS. W. W. STARK PIONEER IN FORESTRY

Mrs. William W. Stark, Commerce, Ga., was not only among the first to promote the cause of forestry in Georgia but one who did very effective work, especially among women's clubs and schools. She was second vice-president of the Georgia Forestry Association for four years in the early years of the organization, being the first woman to hold executive office in the Association.

While serving as vice-president, Mrs. Stark put on an aggressive campaign in the interest of forestry in the women's clubs of the state, offering two silver loving cups to the districts of the Georgia Federation of Women's Clubs doing the best work in promoting forestry. The first cup was awarded to Mrs. Nora Laurence Smith, of Ashburn, for the best record.

(Continued on page 3, column 2)



MRS. W. W. STARK, COMMERCE
PIONEER IN GEORGIA FORESTRY

HIGHWAY DEPARTMENT AIDS WITH FIRES

Roadside Fires to Be Suppressed—Equipment Available to Forest Service for Emergencies.

While directing the forest fire campaign in South Georgia, State Forester B. M. Lufburrow communicated with Governor Richard B. Russell, Jr., and with Captain J. W. Barnett of the Highway Department, and obtained permission for use of highway forces and equipment in forest fire control. Division highway engineers in South Georgia conferred with Mr. Lufburrow and the following day a highway tractor was put on an important fire near Valdosta to make firebreaks.

Captain Barnett has stated that orders would be issued to all highway crews to suppress camp fires and warming fires, and to otherwise take care of fires started along highways. He has also issued orders that highway forces render assistance whenever possible in fire control when called upon by representatives of the Georgia Forest Service.

The aid thus made available for forest fire suppression in the state is considered by State Forester B. M. Lufburrow to be very important and of great help to property owners in protecting their lands against fire damage. It is an aid which the Georgia Forest Service values very highly.

Lincoln county land owners appealed to the county commissioners for the use of convicts in fighting forest fires in October and received assistance from that quarter. Chatham county has a forest fire fighting truck and convicts are subject to call in assisting in forest fire control.

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Forest Fires—Cont'd Spectacular Swamp Fires

Swamps, bays or ponds, as they are variously called in South Georgia, are the scenes of the most spectacular and persistent fires. On account of the long drouth these swamps or low lands that are usually full of water or very damp, are now quite dry. The soil is made of organic matter derived from moss, grass and forest litter. When dry this soil will burn. This is what is occurring in some of the swamps.

When the swamp soil burns the trees of that area are left without root support and crash to the ground. Until enough rain comes to saturate the ground, these swamp fires will continue to smoulder and burn. Fanned by winds, the soil fires flare up and make rapid headway through the surface vegetation and emerge from the swamps to the higher pine lands where grasses and undergrowth create an intense and harmful blaze.

When a swamp fire has only started and occupies little space it can be held in check by digging a trench around it. On account of the drouth no water is near and is not depended upon for combatting the fire burning the soil. In case the swamp fire has been neglected and allowed to spread, as has been the usual case, trenching or any other method of combatting soil fires is impractical. Only enough rainfall to saturate the soil will put an end to them.

It was these swamp fires persisting for weeks, throwing up a great amount of smoke to spread a dense pall for miles that resulted in reports that all South Georgia was on fire.

In dealing with swamp fires the Georgia Forest Service, cooperating with land owners, only undertook to hold the flames in the swamps. This was accomplished both by direct fighting and by backfiring.

State Geologist S. W. McCallie says that it is the belief that the Okefenokee swamp once had much more timber land than at present, the timbered area being reduced by fires burning the peat soil from under the trees. The burned soil areas are now occupied by water instead of trees, the islands in the swamp now covered with trees having escaped the fire.

Backfiring Methods

The greatest difficulty about holding fires to the swamps and to restricted areas in the swamps, has been promiscuous backfiring by timber owners or turpentine lease holders, who become panicky when the smoke drifts in their direction. In fact, the extension of swamp fires has been more largely due to unnecessary backfiring than to the spread of the original swamp fire. New blazes were thus started in the swamps where it is possible the original fires would not have reached.

Some of the most valuable service rendered by the staff of the Georgia Forest Service was in restraining unnecessary backfiring, and in coordinating and controlling backfiring so as not to spread fire to land that need not be burned as a protective measure.

The foresters helped to correct the tendency of property owners and turpentine lease holders to begin backfiring an unnecessarily long distance from the threatening fire. They usually make roads or fences the starting point for backfiring without much regard to their distance from the fire. Much area is often thus unnecessarily burned. The correct method, of course, is to establish a firing line as near to the fire as practicable. In the absence of roads, streams, trails or other natural breaks from which to backfire, plowing may be employed. By the aid of tractors and plows on swamp fires, the Georgia Forest Service was able to establish close in firing lines, thus saving many thousands acres from unnecessary burning.

Destructiveness of Swamp Fires

No forest fires are more destructive than those burning in dry swamps. For the most part the swamps are occupied by valuable hardwoods and cypress. Because of the normal presence of moisture in the soil the tree roots are shallow. Lack of moisture weakens the vitality of the trees and renders them more susceptible to injury from heat. This with burning of the soil brings disastrous results.

Salvaging Swamp Timber

The fact that swamps are dry makes it possible to enter them and harvest the

damaged timber with comparative ease. Those who have swamp timber that fire has damaged would do well to immediately cut and log it, getting it away from the swamp as soon as possible to avoid rapid decay and insect damage that will set up if left in its present place.

Turpentine Operators Active

Much credit is due turpentine operators for their suppression of fires during the drouth. The danger to turpentine "faces" was made more acute by the drouth. Operators patrolled their lands closely and were able to rally help and fight fires which otherwise would have spread and destroyed much property. It is noticeable that as soon as one passes northward out of lands operated for turpentine, there is less fire fighting and more widespread burning by each fire.

Causes of Fires

Most of the fires started during the drouth were evidently accidental. Those who believe in burning off the woods realized that it was too dry to start fires without doing great injury to the trees. Hunters were probably the chief offenders. Building fires in swamps to smoke out 'possums or 'coons that have taken refuge in hollow trees or logs, or the burning of briar patches to drive out rabbits were probably the ways some fires were started. Some were started as warming fires made by hunters and by roadside campers. Some few doubtless used fire to avenge some real or fancied wrong. Railroads evidently started quite a number of fires.

Several South Georgia counties offered \$100 to \$200 reward for evidence to convict woods burners. These rewards were supplemented by offers of \$50 to \$500 by large timber owners, and should have a wholesome effect.

NOTES FROM THE FIRING LINE

Holes 5 and 6 feet deep were found burned in peat soils of swamps.

Forest fire fighters learn to detect a woods fire from a peat fire by the odor of the smoke.

Smoke put up by a woods fire is white, but when it gets on the face of turpentine trees it takes on a dark hue.

The Arabia bay in Lanier county was the largest fire, covering about 8,000 acres. Before foresters got to the fire it had emerged from the swamp and had burned several thousand turpentine "faces". Working day and night in cooperation with timber owners, the fires were confined to the swamp in three days.

The South Georgian says he has "secured" his land when he has backfired and checked the main fire from further ap-

proach, which is a pretty good way to describe it.

Plowing furrows in ground that has not been wet for months is another thing. With a tractor and road plow on which two or three ride, furrows can be plowed.

Two members of the forestry force scouting for fires, put out two fires single handed by beating out the flames.

The best way to get bystanders to fight fire, the foresters found, was to go in and show them how. The initiative and hard fighting of foresters led one land owner to say that the Georgia Forest Service had saved him many thousands of dollars.

The highway crews that went on the fires rendered fine service and were highly complimented by men in the forest service.

The lookout tower on the top of Ware hotel at Waycross was used to advantage in detecting outbreaks of fires in the Waycross region.

While the state foresters from the whole country were visiting the Superior Pine Products area at Fargo a fire call came in. A crew dashed off in trucks and were back in half an hour with the fire out. Capt. I. F. Eldredge in charge of the forest, in the meantime proceeded calmly to explain their plans of operating the 225,000 acre area.

Driving an automobile on a twisting woods road through a smoke so dense one could see only a few feet ahead is another accident in a forester's life on the firing line.

The reporter who surveyed the fire area from an aeroplane and reported all South Georgia on fire must have met with poor visibility due to widespread smoke from very few fires.

One farmer in the fire region said his land had not had a wetting rain since March.

"Let's Report All Fires and Help Stop 'em", appears in large letters on a black board in the lobby of the Appling county courthouse, placed there by County Agent Walker who is also secretary of a timber protective organization. Mr. Walker is an ardent fire protectionist.

A group of students studying forestry at Stockton Consolidated School, headed by Professor Guy Waddell, rendered valuable service fighting fires at Arabia bay.

Mrs. Stark—Cont'd

The second cup was won by Mrs. Don Barnes, of Royston.

In her own district (ninth) Mrs. Stark offered cash prizes to schools organizing forestry clubs and making the best exhibits of wood and woodcraft. She also carried on a publicity campaign in the newspapers of her district and arranged for forestry meetings in the schools.

Mrs. Stark has been prominent in woman's club work in Georgia for several years, having been treasurer of the State Federation, chairman of credentials and civil service; state chairman of woodcraft in public schools; state superintendent of stewardship of the Georgia Baptist Woman's Missionary Union; chairman of forestry, publicity, fine arts, illiteracy and public welfare in the Ninth District Federation of Women's Clubs; president Woman's Improvement Club, Commerce; historian of J. E. B. Stuart Chapter U. D. C.; historian James Pittman Chapter D. A. R.; historian of Madison county and now is engaged in writing a history of the county. She also is president of the Woman's Missionary Society of the First Baptist church of Commerce.

It is with great pleasure that Mrs. Stark is listed in the Georgia Forest Lookout's gallery of notable pioneers in forestry.

ANNUAL TRAIL CLUB MEETING

Tennessee-Georgia Hikers Convene at Helen.

Sixteen hardy hikers from the Smoky Mountain Club of Tennessee, traversed their rugged peaks and came into the Blue Ridge of Georgia on the week end of November 7-8 for the annual meeting of the Georgia Appalachian Trail Club. Forty-five members of the Georgia Club were present.

The annual conference was featured by a square dance in the spacious hall of Mitchell Mountain Ranch and a hike to the top of Tray Mountain, one of Georgia's highest peaks. This trip was one of the most enjoyable of the year on account of the colorful autumn foliage and the cool, pleasant weather.

Mr. E. G. Frizzell, of the University of Tennessee Experiment Station, was the principle speaker on the program. He gave a very interesting and inspirational talk on the Smoky Mountains and the activities of the Knoxville club. Dr. H. M. Jennison, botanist of the University of Tennessee, made a short talk on the Great Smoky Mountain National Park.

Officers elected for the coming year for the Georgia Appalachian Trail Club

were as follows: President, Warner Hall, Decatur; Vice Presidents, Henry H. Estes, Gainesville, and J. M. Tinker, Athens; Secretary, Chas. N. Elliott, Covington; Treasurer, Lewis H. Johnson, Decatur.

Prominent guests attending the conference were Clinton G. Smith, Supervisor of the Cherokee National Forest; Miss Cecelia B. Branham, Brenau College, Gainesville Mr. and Mrs. James A. Hall, Atlanta; Mr. and Mrs. H. M. Jennison, University of Tennessee, Knoxville; and R. R. Ozmer, author and prominent authority on the southern Appalachians.

FOURTH DISTRICT W. G. Wallace, District Forester Columbus

T. J. Fountain of Reynolds to Plant Large Acreage in Pines

Mr. T. J. Fountain of Reynolds, one of the twelve Master Farmers of Georgia, is planning reforestation of more than two hundred acres of formerly cultivated land by planting direct with longleaf pine mast.

Mr. Fountain has the reputation of being thorough in anything he undertakes, therefore successful. Although the direct planting of pine seed on areas to be reforested has not generally proven successful it is hoped that this experiment will produce the desired results, and if so, the method followed will be available to others wishing to plant by seeding.

Old Indian Trail on Pine Mountain To Be Opened up as Scenic Highway and Firebreak

Mr. A. S. Persons, president of the Meriwether County Timber Protective Organization, with the commissioners of Harris and Meriwether counties, and officials of the Meriwether Foundation, Inc., made an organized tour in automobiles of an old Indian trail leading along the ridge of Pine Mountain from Warm Springs to Tip Top, where the Columbus-Atlanta highway goes over Pine Mountain. This old Indian trail follows along the ridge for a distance of about twelve miles, and is the location of a proposed scenic route that has long been in the minds of hundreds of Georgians. The Hon. George Foster Peabody, in a letter to the Columbus Inquirer-Sun, called the attention of people in this section to the scenic possibilities of Pine Mountain and its attraction to tourists. Dr. Peabody in all probability, has dreamed of a scenic route along the ridge of this beautiful little mountain range.

The Georgia Forest Service is anxious to see this project developed, and to have the entire mountain range finally incorporated into Timber Protective Organizations similar to the one now protecting the timberlands around Warm Springs.

Parson Huit Preaches Fire Protection From Pulpit

A. H. Huit, colored preacher and land-owner, living in Chattahoochee county believes in preaching fire protection from the pulpit. Parson Huit is one of those good souls who believe that if you set the Devil's weapon, fire, to destroying God's woods the Devil is likely to soon catch you.

EIGHTH DISTRICT H. D. Story, Jr., District Forester Albany

Flint River T. P. O.

Flint River Timber Protective Organization, located in Decatur county with a small area extending into Seminole county, was formed September 22 with an area of 33,016 acres owned by W. G. Powell and son, George S. Tucker, Dr. H. H. Brinson, Charles Hodges, G. W. Donalson and C. M. Freeman.

Dr. R. L. Z. Bridges listed 5,640 acres in this T. P. O. on November 3 for protection which makes a total of 38,656 acres.

W. G. Powell and son, Lamar Powell, signed up a large portion of this area. They have been engaged in the naval stores business for a good many years, working a part of their land for turpentine and grazing cattle on their holdings. They have been interested in fire protection and have actually been protecting a large area for several years by putting in fire breaks unassisted.

There are good prospects for a large T. P. O. in this locality as people are very much interested.

Dr. Bridges is a naval stores operator; Charles Hodges is grazing cattle on his land and has shown unusual interest. He, with Lamar Powell, assisted in the organization of the unit.

The officers are: W. G. Powell, president; Lamar Powell, vice-president, and Charles Hodges, secretary-treasurer.

All budgets have been completed and work is to begin soon.

Cemocheechee T. P. O.

The Cemocheechee Timber Protective Organization of Fort Gaines, in Clay county, was organized September 5, with an area of 10,055 acres and 14 members.

The officers are: E. R. King, president; Zach Arnold, vice-president; and D. C. Brumbalow, secretary-treasurer.

The members are as follows: Zach Arnold, Senator E. R. King, P. C. King, G. W. Garrison, A. J. Shaw, W. G. Grimsley, A. C. Sutton, W. G. Gay, J. W. West, Mayor B. M. Turnipseed, N. H. McLendon, Dr. J. O. Baldwin, J. E. Peterson, J. B. Grimsley.

This area is pretty scattered but there is a chance to block it in so that it will be fairly solid when the people see how the organization functions.

D. C. Brumbalow, county agent, and Senator E. R. King were of considerable assistance in organizing this T. P. O.

SIXTH DISTRICT Jack Thurmond, District Forester Savannah

Protective Work Started on Liberty T. P. O.

On October 15th, Mr. W. I. Stafford, Patrolman on the Liberty County T. P. O. started fire-break construction work on the 21,000 acres of land listed in the organization.

The work is being done with a Fordson tractor and side plow. In wet weather this type of output is not so good but due to the continued drouth in Southeast Georgia the bays and ponds are all dry and plowing with this type of outfit has proven to be the most economical and successful.

Fire-breaks are constructed on this organization by plowing two furrows 25 to 30 feet apart and burning out the intervening strip. Mr. Stafford states that for the 50 miles of break that he has already plowed the average cost for plowing has amounted to \$2.00 per mile. The burning out of the strip will be done just as soon as there is a little moisture in the soil and will be contracted to different individuals at \$1.50 per mile which makes the total operation cost \$3.50 per mile.

To date Mr. Stafford has reported no fires on the land listed in the Liberty T. P. O. but on unprotected lands in the county numerous fires have occurred which have caused untold damage. All land-owners in this county are urged to see Mr. Stafford and arrange to cooperate with him in the protection work and be careful with fires in this time of great danger.

Treutlen T. P. O. Constructs Breaks

Fire break construction work has started on the Treutlen T. P. O. as Mr. James Fowler, Jim Gillis and M. H. Newsome go into their fifth year of fire protection work. They use the plowed and burned breaks and have obtained good results with them since they started the work. Several small fires have started on this organization's area but due to the efficient system of protection used they were extinguished before doing any material damage. The few fires occurring in this county were started from trains and roadside fires. No fires appear to have been started by any local individual as the education against woods burning in Treutlen county has reached a stage where all the people know the harm that results and they are all anxious to keep the woods rough.

STATE FORESTERS

MET IN SOUTH

Georgia and Florida Hosts to One of Most Successful Sessions of National Association — Studied Pine Belt.

On October 16, the opening session of the National Association of State Foresters was held at Savannah with the Georgia State Board of Forestry as host and with Secretary of State John Wilson acting as toastmaster. The visitors from all parts of the country heard words of welcome from T. G. Woolford, Atlanta, president of the Georgia Forestry Association; J. Cheshire Nash for Savannah; and United States Senator William J. Harris. E. O. Siecke, president, responded. After announcements by State Foresters B. M. Lufburrow of Georgia and Harry Lee Baker of Florida, visiting foresters were introduced.

After a tour of Savannah, the foresters proceeded to Brunswick, visiting Old Midway church enroute. At Brunswick the Hercules Powder Company pine stump utilization plant and the Georgia Creosoting plant were inspected.

Proceeding to Waycross, a night session was held. E. O. Siecke delivered the president's address. C. S. Judd spoke on forestry in Hawaii, Prof. Paul Chapman told of forestry in vocational schools of Georgia, and State Forester Fred Merrill of Mississippi and H. L. Demmon, director of the Southern Forest Experiment Station at New Orleans, spoke on the effect of fire on longleaf pine.

Visits were made to forests of the Timber Products Company, Cogdell and Superior Pine Products Company, Fargo, on Tuesday. Reaching Jacksonville a night program consisted of addresses by Fred Morrell and A. B. Hastings of the U. S. Forest Service on cooperative relations of federal and state forest services.

On Wednesday visits were made to the Osceola National Forest and naval store laboratories, and to the McCloskey turpentine still near Lake City where brief talks from E. W. Hadley, V. L. Harper and Geo. P. Shingler of the federal service were heard. A visit was made to branch naval stores experiment station at Stark and state nursery at Raiford.

At Ocala a business session was held and the next day the forestry party visited Daytona Beach and St. Augustine, returning to Jacksonville, where the session formally ended.

Birds have effectively controlled two outbreaks of the southern pine beetle in the Pisgah National Forest, North Carolina, according to observations of R. St. George, of the Bureau of Entomology.

GEORGIA FOREST LOOKOUT

Volume 2

ATLANTA, GA., JANUARY, 1932

Number 1

FIRST ANNIVERSARY

FOREST LOOKOUT

The Georgia Forest Lookout has appeared for twelve consecutive months. In each issue an attempt has been made to promote the interests of forestry in Georgia. How well this purpose has been served is left to the judgment of our readers.

The second year of the Lookout is launched with a determination to make it better. To make it bigger is not now possible. Readers are invited to suggest how to make the publications better and to contribute items of interest.

FOREST FIRE PUMPS

NOW AVAILABLE

The board of forestry authorized the purchase of a number of portable fire pumps to be located at each office of the assistant state foresters and district foresters especially to assist unorganized timber owners. These pumps are now available at Macon, Waycross, Savannah, Albany, Columbus, Rome and Gainesville.

The board also authorized pump manufacturers to ship on consignment a number of pumps to the Georgia Forest Service, these to be sold at cost to landowners. This was to quickly supply the widespread demand for pumps during the fall outbreak of fires. No local supplies were then available.

The pumps ordered are 5-gallon size, costing \$5.25 each. With express added, the sale price is \$5.75. Anyone desiring pumps can order from the nearest forestry office mentioned above.

These portable fire pumps are very useful in spraying down flames so that fire fighters can get in close enough to swat them out and finish up. They are also useful in cleaning up fires in logs, stumps, and snags that may spread fires and cause new outbreaks. They also lend themselves to several uses on the farm.

MRS. J. L. WALKER

FORESTRY PIONEER

One of the very first to get a vision of forestry in Georgia is Mrs. J. L. Walker of Waycross. Before Mr. Bonnell H. Stone and others inaugurated a statewide movement in forestry, Mrs. Walker was putting on a forestry program in Ware county. Year after year, she visited the schools of the county proclaiming a message the subject of which was: "Stop burning the wiregrass and thereby aid in reforestation."

Mrs. Walker has not only advanced the interests of forestry by her talks but by writings in the local paper. In the Waycross Journal of December 24, 1924, Mrs. Walker outlined a comprehensive program of forestry activities including forest parks, roadside beautification, forestry programs for schools, activities for civic organizations in forestry and forestry legislation.

Mrs. Walker has been active in women's club work. Her valuable contributions to forestry in Georgia are gratefully recognized, and it is with pleasure that she is given a place in the gallery of notable pioneers of forestry in Georgia.



MRS. J. L. WALKER, WAYCROSS,
FORESTRY PIONEER

CONSOLIDATION PLAN

NOW IN EFFECT

Department of Forestry and Geological Development Came Into Existence January 1 — Forestry and Geological Interests Now Directed by a Commission Headed by Governor Russell — New Unit Starts Auspiciously.

With January 1, the Department of Forestry and Geological Development came into existence. The Georgia Forest Service and the Georgia Geological Survey are now operating as a unit under a commission. Members of this commission are Governor Richard B. Russell, Jr., (ex-officio) chairman; Bonnell Stone, Oxford; C. B. Harman, Atlanta; Leonard Rountree, Summit; Alex Sessoms, Cogdell; Mrs. M. E. Judd, Dalton, and one member to be appointed.

The last meeting of the Georgia State Board of Forestry was held in November. At this meeting a resolution was passed by those who are to continue on the new board, thanking the retiring members for their valuable services in promoting the interests of forestry in Georgia. The old members who are not on the new commission are: Secretary of State John Wilson; J. Phil Campbell, Athens; State Geologist S. W. McCallie, Atlanta.

At the time this issue of the Georgia Forest Lookout goes to press the new commission had not met and organized, but preliminary steps have been taken which indicate an auspicious and harmonious launching of the new department.

It is considered fitting, at this time, to give a brief sketch of the members of the commission who are to serve this new department.

Governor Russell—It would be difficult to add anything to what the public already knows about Governor Russell, but it may be stated that His Excellency was reared

GEORGIA FOREST LOOKOUT

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on a farm near Winder; learned the trees by daily contact and is keenly interested in the fullest development of the great forest possibilities of this state. As chairman of the State Board of Forestry, he has already not only manifested great interest but has made valuable suggestions and given direction to important movements looking to the protection and upbuilding of Georgia's great forest resources. Friends of forestry and geology are looking to Chairman Russell with confidence, and are expecting forestry and geology in Georgia to progress rapidly under his leadership.



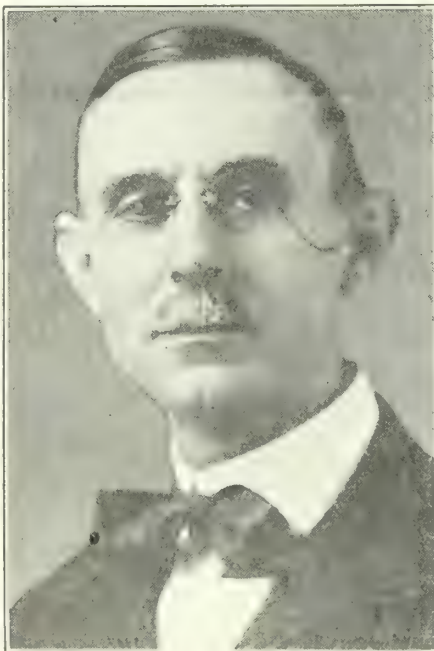
GOVERNOR RICHARD B. RUSSELL, JR.,
CHAIRMAN OF BOARD

Bonnell H. Stone—Mr. Stone is frequently referred to as the "Father of Forestry in Georgia", because he was one of the first to catch a vision of forestry possibilities in the state and is credited more than anyone else for the upbuilding of forestry in this state. He is a native of Newton county, educated at Emory University and the School of Forestry of the State College of Agriculture. He has followed the vocation of forester, first with the fed-



BONNELL H. STONE, OXFORD

eral government and then as forester of privately owned lands in North Georgia. He helped organize the Georgia Forestry Association, sponsored legislation creating the Georgia Forest Service, has served as a member of the state forestry board from its beginning, served as president of the Southern Forestry Conference and as a member of the Advisory Council of the Southern Appalachian Forest Experiment



C. B. HARMAN, ATLANTA

Station of the federal government at Asheville.

C. B. Harman—Mr. Harman is identified with the lumber interests of the South, particularly in the manufacturing side of the industry. He was among the first to become active in promoting the forestry interests of the state, giving much time and valuable service to the Georgia Forestry Association and the Georgia State Board of Forestry. He is chairman of the Executive Committee of the Georgia Forestry Association and has served on the State Board of Forestry from its beginning.

Mr. Harman is the author of technical books on millwork and writer of occasional articles of popular nature. He is a native of South Carolina but for many years has been a Georgian.

J. Leonard Rountree—Mr. Rountree, a large landowner, farmer, turpentine operator, legislator, benefactor and outstanding citizen of South Georgia, resides at Summit in Emanuel county. As a member of the legislature, he was among the first seeking to enact laws favorable to the development of forestry in this state. He was a pioneer in promoting the Georgia Forestry Association and



J. LEONARD ROUNTREE, SUMMIT

as a member of the State Board of Forestry, rendered valuable service in developing the work of the Georgia Forest Service.

Mr. Rountree has endeared himself to the region in which he resides by his unselfish and liberal contributions of service and means to the promotion of the welfare of the people.

Alex K. Sessoms—One of the big timber owners of Georgia, who is practicing modern, big-scale forestry, resides at Cedell in South Georgia. He was among the first to catch a vision of forestry in the state, and has been a leader in all public movements looking to its upbuilding. He is recognized as having exceptional business ability and his services to the State Board of Forestry along this line have been outstanding.



ALEX. K. SESSOMS, COGDELL

Mr. Sessoms brings to the board his valuable experience in all phases of forestry. His large developments include the operation of a steam turpentine still, private railroad, forest management and forest protection with fire towers, fire equipment, etc.



MRS. M. E. JUDD, DALTON

Mrs. M. E. Judd—The only woman member of the board is Mrs. M. E. Judd, Dalton, in this capacity representing women's organizations of the state in which she has been a leader for many years. By profession, Mrs. Judd is a landscape architect. She practices forestry on her estate near Dalton and has been ardent advocate of forest protection, roadside beautification and forest parks.

Mrs. Judd has been an active member of the Georgia Forestry Association of which she is an officer and has been a regular attendant and constructive worker in the State Board of Forestry. Recently

Mrs. Judd was appointed by Governor Russell as a member of the State Board of Control in charge of Eleemosynary Institutions of Georgia. She is prominent in southern and national women's clubs, and in park and recreational associations, in all of which her ability is highly valued.



B. M. LUFBURROW, STATE FORESTER



S. W. MCCALLIE, STATE GEOLOGIST AND RETIRING MEMBER OF STATE BOARD OF FORESTRY

DIVISION CHIEFS

The Department of Forestry and Geological Development has two division chiefs, B. M. Lufburrow, state forester, and S. W. McCallie, state geologist, each retaining the position previously held. Mr. Lufburrow has been state forester since October,

1925, when the forestry department came into existence. Mr. McCallie has served as state geologist for 23 years and, previous to that, as assistant state geologist for 15 years.



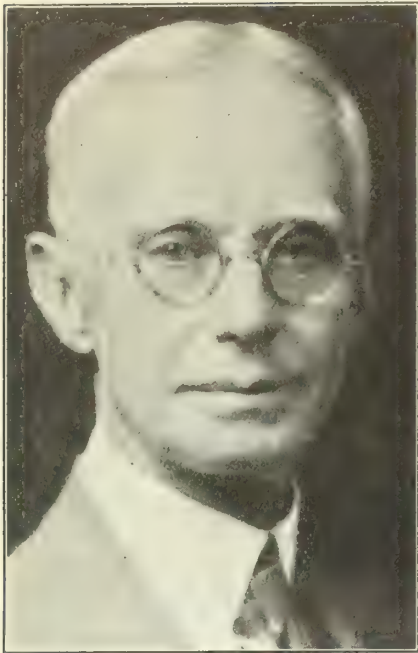
J. PHIL CAMPBELL, DIRECTOR OF EXTENSION, STATE COLLEGE OF AGRICULTURE, RETIRING MEMBER OF OLD FORESTRY BOARD



JOHN B. WILSON, SECRETARY OF STATE, RETIRING MEMBER OF OLD FORESTRY BOARD

RETIRING BOARD MEMBERS

Members of the State Board of Forestry who retired with the incoming commission were given a vote of thanks and appreciation by the hold-over members at the last meeting of the State Board of Forestry. The three retiring members are Secretary of State John B. Wilson, J. Phil Campbell and S. W. McCallie.



Charles H. Herty, in charge of research in paper manufacture in commercial laboratory plant, Savannah, beginning his duties January 1, 1932, using funds appropriated by the State and the Chemical Institute of New York City.

BLACK GUM MAKES GOOD WHITE PAPER

Forest Products Laboratory Finds Wood Valuable—Southern Forest "Weed" Assumes Importance.

In a statement made for the Savannah Morning News, Dr. Charles H. Herty, in charge of paper research in Georgia, says of the common black gum of the south: "Experiments made at the United States Forest Products Laboratory at Madison, Wisconsin, and recently published in the paper trade journals have shown that black gum is one of the most valuable woods for the production of white paper. It can be readily pulped, giving a strong fiber and, because of its very light color as it grows in the woods, requires but little bleaching agent to bring it to the necessary whiteness for the finest uses.

"Two important facts were brought out by these researches: First, it has been clearly proven that 1.54 cords of black gum will make the same amount of pulp as two cords of northern spruce; second, that only 5 per cent of bleaching liquor is required for black gum as against 12 to 13 per cent for northern spruce."

LOG CABIN PLANS

In response to requests from several agricultural schools for constructing log cabins on school forests, blue prints of plans were made by C. N. Elliott and sent to all vocational schools. Schools that have erected cabins enjoy them very much

FORESTERS PLEASED WITH GEORGIA-FLORIDA TRIP

Delighted With Entertainment and Instructive Trip Through Forest Areas of Southland—What Some Visitors Have to Say.

State foresters who attended the annual session of their National Association, held in Georgia and Florida, were delighted with their entertainment and with the instructive trip arranged. State Forester B. M. Lufburrow has received several letters from the state foresters from which the following extracts have been taken:

"You people in the southeastern part of the United States are certainly awake to your problems and it pleases me greatly to see so many landowners and private citizens really actively engaged in support of the things we foresters feel should be brought about."—George R. Phillips, State Forester, Oklahoma.

"It was a delight to be back in the state that gave me my original training. * * * I was delighted to find so much enthusiasm exists not only among board members and members of the Georgia Forestry Association. It can easily be seen why Georgia has progressed so rapidly because it has a large cooperative group of citizens who are thoroughly imbued and enthused with the forestry idea."—V. H. Sonderegger, State Forester, Louisiana.

"I have just returned from my trip to southern Florida and want to take this occasion to thank you for the splendid entertainment which you furnished the state foresters. The trip through southern Georgia was most instructive."—A. F. Hawes, State Forester, Connecticut.

"Allow me to thank you, both personally and in the name of our Department, for the splendid program. * * * I was extremely glad to get firsthand information about the growth and distribution of slash pine. The personal touch with your big second-growth land owners, Mr. Alex Sessoms and Captain I. F. Eldredge, was worth the whole trip. Their enthusiasm was good to see."—J. S. Holmes, State Forester, North Carolina.

"I have never attended any meeting where details were worked out so well. It was my first trip down there and it certainly left a favorable impression with me."—Charles R. Meek, Department of Forests and Waters, Pennsylvania. From the same department, Lewis E. Staley writes: "You are to be congratulated highly on the excellent planning and putting into effect the whole tour. I heard nothing but very favorable comment from everyone."

"It was a great pleasure to be with you at the meeting of foresters."—Wm. J. Harris, United States Senator from Georgia.

"I want to take this opportunity to express my appreciation to you for the most instructive trip I enjoyed upon the occasion of my visit with the Association of State Foresters through your state."—W. S. Taber, State Forester, Delaware.

"I wish to thank you very heartily for the wonderful trip that you and Mr. Baker framed up for us in Georgia and Florida."—Ben E. Bush, State Forester, Idaho.

"It was my first visit to your state, and I have come back with an entirely different idea of your forestry problems. It

appears that you have the support of some very influential people behind you and I can see success ahead."—L. F. Cronemiller, State Forester, Oregon.

"I want to express my appreciation for the many courtesies shown me on my recent trip in your state and to let you know that I thoroughly enjoyed every part of the program which I thought was exceedingly well worked out and executed. This was my first opportunity of visiting southern Georgia and I feel that I gained a lot by attending the state foresters' meeting and the field trips. You and Mr. Baker are to be congratulated on a most interesting and excellent meeting."—H. J. Eberly, District Forest Inspector, U. S. Forest Service.

"I want to thank you for your extreme courtesy and to compliment you on the splendid way in which the Georgia end of the trip was planned and put through."—C. P. Wilbur, State Forester, New Jersey.

FORESTRY PAYS IN SOUTH

M. B. Pratt, State Forester of California, reporting to the governor on his attendance of the annual meeting of state foresters and of his impressions of forestry in the southeast said: "About 25 years ago I was led to believe that the timber resources of the South were practically exhausted, and that the naval stores industry was about at an end. It is true that most of the virgin timber has been cut, but young timber has come in at an amazing rate and is yielding more turpentine and resin than in former days as well as a large yield of lumber and pulp wood. The high survival of the planted stock is another indication of the forestry possibilities of this region. The rapid growth of the pine trees, coupled with the triple uses, namely, naval stores, lumber and pulp wood, make the practice of forestry a more paying proposition than in any region I have seen".

FORESTER IMPRESSED WITH SOUTHERN PINE

State Forester Lynn F. Cronemiller, of Oregon, reporting impressions of the southeastern trip of state foresters in "The Forest Log", published by his department, says among other interesting things the following: "From statement made by southern foresters and what was seen of the piney woods on a several hundred mile trip, it seems apparent that a timber famine in the south is farther away at the present time than was indicated ten years ago. The reproduction coming in is remarkable, and what is still more remarkable, the seedlings after reaching a height of several feet are very seldom killed by fires. Only in two spots, and these were very small areas, was there any evidence of fire crowning and killing the trees. Investigation has proved, however, that the growth of the trees is very seriously retarded by fires".

FIRE SITUATION

IN NORTH GEORGIA

While the early part of the fall was extremely dry throughout North Georgia, there was a marked improvement in the number of forest fires occurring. Both the National Forest and the timber protective organizations of the Georgia Forest Service report few forest fires occurring on the areas under their protection.

About the time the leaves begin to fall, which greatly adds to the fire hazard, rains occurred generally over this section and practically no fires have been reported during the last month.

While fires have occurred to some extent on private lands which are not under organized protection, it appears that the average owner is beginning to be aware of the fact that forest fires cause a useless destruction and it is well worth the effort to prevent their occurrence and to suppress them where they do occur.

The mountain region of North Georgia with its normally heavy rainfall serves as a natural resource, and with the increase of protection given this region the more of the rainfall will be conserved and held for future use rather than running off, and causing eroded hillsides and swollen streams.

Emergency fire equipment has been provided for the Gainesville, Rome, and Columbus offices of North Georgia, and land owners are invited to call on the district foresters for an inspection or a demonstration of this equipment at any time.

E. B. Stone, Jr., Assistant State Forester.

TREUTLEN HAS COUNTY-

WIDE FOREST PROGRAM

County School Superintendent Is Introducing Forestry in All Schools to Teach Importance of Forest Fire Prevention.

All the schools of Treutlen county, both white and colored, are teaching forestry to all the school children of the county in order to develop a forestry consciousness and do all that is possible to stop forest fires.

Through the cooperation of Mrs. W. L. Sessions, County School Superintendent, and the efforts of Mr. R. D. Pulliam, Teacher of Vocational Agriculture at Soperton High School, instruction has been given and information distributed to all the teachers of the county at county teachers' meetings.

Efforts and cooperation of the public is necessary to successfully combat the greatest forest enemy—fire. Education of the public will help to secure this. "Stop forest fires—grow timber—it pays," is the slogan.

FOREST FIRE RECORD

FOR FALL FAVORABLE

In Drouth Stricken South Georgia Area Burned Over in October and November Only 2½ Per Cent According to Survey of Georgia Forest Service.

A survey made of the burned area of 61 counties in South Georgia for the months of October and November show that it is only 2½ per cent of the forested lands of the area. In view of the long drouth and the combustibility of forest material, this is considered an excellent record. The probabilities are that less than the usual area was burned over for those two months. This good record is attributed to a growing willingness of the people to fight forest fires.

The alarming reports sent out to papers were based on smoke rather than on fire. The great amount of smoke is attributed to two causes—(1) the unusual swamp fires that put up a great deal of smoke and continued burning in many instances for weeks in the peat soil and (2) the long Indian summer weather which kept the smoke near the ground.

As stated in the December issue of this publication, if fires can be held down when the hazard has been the greatest in years, they can be held down any time. The danger was greatly reduced by the rains that came in December.

The season of greatest burning is in late winter and early spring. Land owners are urged to do as well in that period as they did in the fall. If this is done, it will result in the best forest fire record the state has ever had.

Attention is called to the fact that the fires of the timber protective organizations have been handled promptly and effectively with comparatively little loss, showing that control of forest fires depends on organized cooperative effort of timber owners.

INDIAN SPRINGS PARK

IMPROVEMENT PROGRAM

During the first part of December the Georgia Forest Service carried on additional planting operations on the Indian Springs State Forest Park, 330 trees and shrubs being planted out during this operation, the plants being all native trees and shrubs.

This is a part of the regular plan for the development of Indian Springs property and will result in restoring this area to some of its former glory before the timber was removed after it had passed into the hands of the white man. The plans, which were prepared by Mrs. M. E.

Judd, well known landscape architect, called for the eventual reforestation of practically the entire ten acres in the original tract and the open areas on the additional 12 acres which were presented to the State by the citizens of Jackson.

A similar planting carried out last spring has been very successful, and, in spite of the extreme drouth in that section during the summer months, practically all of the plants have survived, as a result of the careful attention given them, provision having been made so that they can be watered whenever needed.

Indian Springs was visited during the last year by more than 50,000 people, and with the completion of more hard-surfaced roads it is estimated that still larger numbers will seek recreation in this one of Georgia's two State Forest Parks.

E. B. Stone, Jr., Assistant State Forester.

HARDY TUNG OIL

TREES INTRODUCED

The introduction of the tung oil tree in Florida, South Georgia, and in the Gulf region of other southern states, is progressing rapidly. The tung oil tree provides what is known as "wood oil" in trade and is used in paints, varnishes, linoleum, etc. The supply has been coming from China.

The trees most commonly planted came from South China and are not winter hardy, hence plantings have been confined to the lower south. But trees obtained from North China have been introduced that can be planted further south.

The Georgia Experiment Station near Griffin has been experimenting with tung oil trees for several years. The trees it has obtained from North China have grown rapidly and are coming into bearing. The indications are that the Experiment Station has found varieties of the tung oil tree that will do well over a great part of the state.

HALL WINS PRIZE

H. E. Hall, vocational agricultural teacher at Omaha Training School, Omaha, Georgia, won the \$50 prize for the best work done on the forestry project among colored schools for the school year of 1930-31. This prize was given by the Georgia Forestry Association and was presented by Gordon E. Reynolds, vice-president of the Association, at a colored farmers' meeting held December 4 at the Georgia Normal and Agricultural College, Albany.

James Fowler, Soperton, Ga., a large-scale tree planter of Georgia, will appear on the program of Farmer's Week at the State College of Agriculture, and represent forestry interests of Georgia.

FOREST CLUB THINS

MEMORIAL PARK FOREST

Recently the Stephen Heard chapter of the Daughters of the American Revolution presented to the state chapter of that organization five acres of land which is said to be the original home site of the daring Nancy Hart, of Revolutionary fame. Since funds for thinning the forest of this new Nancy Hart Memorial Park were insufficient, the leaders of the Stephen Heard chapter called on the Forestry Club at Fortsonia for assistance. Mr. F. M. Young, vocational teacher, took his club to the park and did a very creditable job.

As a reward for their meritorious work, the Stephen Heard chapter of the Daughters of the American Revolution gave the boys a book shower, which materially increased the library of the school. The boys expected no such reward and are gratified with the donation.

STUDY OF SWAMP FIRES

The rare outbreak of forest fires in swamps of South Georgia in the fall following a long drouth presented an interesting study for vocational students in that region. To facilitate this study the Director of Education of the Forest Service sent a number of pertinent questions to vocational teachers with answers as an aid to an understanding of the significance of these fires.

CHAPMAN ADDRESS

ON SCHOOL FORESTRY

The address of Paul Chapman, director of vocational education of Georgia, delivered before the meeting of the National Association of State Foresters at Waycross made such favorable impression that President E. O. Siecke of the association asked that copies be made and distributed to all forestry departments in the United States.

The forestry project in Georgia schools inaugurated by the Georgia Forest Service and developed in cooperation with the Smith-Hughes, or the vocational agricultural schools, is the first of its kind, and the success achieved has attracted wide and favorable attention.

Copies of Professor Chapman's address have been made and Mr. Siecke, State Forester of Texas, is giving them wide distribution.

The next meeting of the State Foresters Association will be held in New Jersey, according to action of the Executive Committee following the recent session of the Association held in Georgia and Florida.

FOURTH DISTRICT

W. G. Wallace, District Forester

Columbus

Taylor-Talbot T. P. O.

Owing to sentiment started by a forestry meeting at Butler, Ga., last September, a timber protective organization has been perfected which embraces a tract of about 15,000 acres of forest land lying in Taylor and Talbot counties.

Officers of the new organization are W. A. Payne, Pres.; J. S. Green, Vice-pres.; and C. F. Varnewood, Sec.-Treas. Plans for protecting the lands listed in the organization are well under way. Portable fire pumps have been purchased and plans are under way to equip a truck with large tanks for transporting water to use in hand pumps for controlling woods fires.

According to figures of the Georgia Forest Service there are 130,633 acres of potential forest land in Taylor county. At least 60,000 acres of this must be of the sandy-ridge, longleaf pine type forest land which is well known for its ability to produce fast growing longleaf pines. This entire area should be under intensive protection in order to foster good reproduction and protect the standing timber.

Grantville Public School to Plant Barren City Property With Pines And Blacklocust.

Under the progressive leadership of Mr. C. S. Colley and Mr. D. C. Peterson, Principal of the Grantville public school, a program is under way to plant certain areas near the school with pines and blacklocust. Under the present plan planting stock will be secured by the town of Grantville and will be planted by students of the local school.

Grantville is to be highly commended for this forward step in forestry. This project will not only change these barren lands from a liability to an asset, but will stand as an outstanding example of profitable land utilization to the community. Mr. Colley, personally, plans to plant a quantity of blacklocust seedlings on his property for future fence posts.

Newnan to Plant 25,000 Seedlings on Town Forest

The Newnan Water and Light Commission, through its chairman, Mr. H. H. North, has an order placed with the State Nursery at Athens for 21,000 pine seedlings and 4,000 blacklocust seedlings to be planted on the Newnan Town Forest which covers an area of 800 acres. This is only the continuation of a planting program inaugurated last year when 16,000 pine seedlings were planted.

The management plan of the Newnan Town Forest calls for extensive improve-

ment cuttings. Several hundred cords of dead, diseased, and trees of undesirable species were cut into fuel wood last winter for the needy of the city. Trees are marked and are now being cut to supply the needy this winter. The results of these improvement cuttings are not only to fill an urgent need for fuel wood, but the forests are greatly improved since small suppressed trees are liberated by the cutting of the undesirable trees that formerly overtopped them. This system of cutting fuel wood could be used profitably by landowners.

SIXTH DISTRICT

Jack Thurmond, District Forester

Savannah

Reward of \$75.00 Offered for Woods Burners

At a recent meeting of the Liberty county T. P. O. a resolution was passed by the officers and members of the organization to offer \$25.00 reward for proof to convict any person or persons caught putting fires on any land listed in the Liberty County Timber Protective Organization. This resolution offering the reward was passed during the extreme dry spell.

In addition to the reward offered by the Liberty County T. P. O. the County Commissioners of Liberty county authorized the clerk to offer \$50.00 reward for proof to convict anyone found putting fire in any woods in the county. They also ordered that suitable signs be printed and posted over the county calling the attention of the people to this step taken by the commissioners so that all of the citizens would be informed of this movement and regulate their actions accordingly. Liberty county has taken an active part in fire protection work and are among the leading counties of the State due to the interest that all of its citizens have taken in keeping the woods rough.

Fire Protection in Liberty County Successful

W. I. Stafford, patrolman of the Liberty County T. P. O. writes:

"It is indeed very encouraging to ride along the highways and byways in Liberty county and observe the young Slash Pine timber which almost as a whole has escaped the ravages of fire during the long dry spell.

"We have had three fires in Liberty, one on protected land and two off, that threatened to destroy large areas, but owing to the splendid fire fighting spirit exemplified by both the white and colored citizens these fires were soon completely stopped.

"Our district forester came to our aid with five fire pumps and soon showed u

that at least one North Georgian had some ability as a fire fighter, also, that he could scent a wire-grass and pine straw smoke all the way from Savannah to Liberty county.

"It is an ill wind that blows no good, and from expressions I've heard, the public is becoming more convinced of the possibility and practicability of keeping our woods rough. They are opening their eyes to the fact that with good clean fire-breaks well connected, and good fire fighting equipment, coupled with the sort of fire fighting shown at these fires, that we can soon stop any woods-fire.

"Already four outside landowners with around 3,000 acres have expressed their desire to join the organization and have their lands protected in a business like and systematic way, as we are trying hard to do.

"I find that fire protection is growing in favor among our citizens, and really, it is only the extremely hard times that are keeping many landowners from joining the T. P. O. They are realizing that real honest-to-goodness cooperation can and does accomplish things.

"Our county agent, Mr. G. B. Eunice, is organizing a Boys' Forestry Club and we hope to soon have a course in Forestry taught in both white and colored schools of our County."

Screven County Training School Has Forest

A school forest has been established in Screven county at the Training School. All the plots have been surveyed and map and management plans are in the process of making. T. W. Bryan, the teacher in charge of vocational work at the school has a lot of interest worked up among the students and colored citizens of the county. He is endeavoring to show all the colored people of the county what fires do to timber and the results you can expect by having a good protective system together with the proper management over a period of ten years.

Long County T. P. O. Constructs Breaks

On December 10th the patrolman in charge of fire protection and fire-break construction on 12,000 acres of timber land in Long county started to work.

He is building the fire-breaks by plowing two furrows 25 feet apart and will eventually burn out the intervening strip. He is using a Fordson tractor and two disc plow which throws out a good clean furrow which will make the burning of the strip very easy, in fact the plowing costs \$2.00 per mile and burning \$1.50 per mile which makes the complete fire-break plowed and burned \$3.50, which is very reasonable.

The protection work as carried on by

the Long county T. P. O. is financed by assessing each landowner 5c per acre and paying all bills from pooled funds. Each land owner is assessed the same and the organization is following all regulations as outlined by the Georgia Forest Service.

SEVENTH DISTRICT C. Bernard Beale, District Forester Waycross

Low-Cost Plowed Breaks Now Available

Using a "thirty" crawler type tractor and a five-disc plow, an outfit is now operating in the seventh district constructing plowed fire breaks at \$3.00 per mile.

The plow makes a cleared strip 5 to 8 feet in width and plows to a depth of 6 to 8 inches. The break resembles a V-shaped ditch, thus having the added advantage of affording drainage. The outfit has met the demands of practically every timber and vegetation type satisfactorily, making a dependable break in even the thickest roughs. The plow readily cuts thru pine and palmetto roots and fairly good breaks are made through oak "runners" and dry cypress ponds.

To date 250 miles of such breaks have been plowed on Big Bend T. P. O. lands of W. C. Hopkins, Oliver and Bell, and L. Knabb, in south Charlton county. An outfit is now at work on Marsh Bros. and Wilson lands in the Consolidated T. P. O. area putting in 100 miles.

Many land owners are taking advantage of the very low cost at which these breaks are being constructed. It is doubtful if any other type of burned strip or plowed break can compare with the effectiveness of this break.

Dyal Building Wooden Tower

J. E. Dyal, enthusiastic member of the Appling County T. P. O. is building a look-out tower 90 feet high out of cypress timber. It will be located near Surrency on Mr. Dyal's property, and will be of great service to that community in locating fires.

Thirty-five Pumps Placed

Thirty-five Indian pumps have been sold out of the Waycross office. A supply of 12 are now on hand, and those needing same should supply themselves with this equipment at once. The price is \$5.75 each.

New T. P. O. Members

Recent additions to T. P. O.'s in this District are: Tyler Estate, O. J. Hood, Manager, Waynesville, 15,000 acres, Wayne T. P. O.; W. C. Hopkins & Brothers, 23,000 acres, Wayne T. P. O.; R. M. Miliken, Jesup, 4,000 acres, Wayne T. P. O.; Peninsula Naval Stores Company, Jacksonville, 4,660 acres, Big Bend T. P. O.

Pittman Helps Organize

W. W. Pittman, Pierce county operator, has recently devoted considerable time in an effort to organize a T. P. O. in Pierce county. Mr. Pittman leases most of his timber, but would rather have fire break protection than to rake his leased timber, he states.

SCHOOL ESTABLISHES FOREST FIRE PATROL

Commerce High School Under Leadership of C. L. Veatch, Vocational Agricultural Teacher, Aids in Forest Fire Fighting.

Another achievement of the Commerce High School, in promoting the interests of forestry, is the organization of the students into fire patrol units. Students attend the school from a wide area in the county, and not only report forest fires but render assistance in suppressing them.

Professor C. L. Veatch, vocational agricultural teacher, who two years ago received a prize from the Georgia Forestry Association for outstanding work done on the forestry school project, is behind this movement. Professor Veatch is also editor of the Commerce News.

The plan was initiated by Professor Veatch and is an entirely new phase of forestry work by vocational agriculture students. The students not only watch for fires and fight them but are urging forest fire prevention among landowners. They are trying to make a record for their section of the county for forest fire control. In doing this, they are setting an example for similar schools all over the state.

The students of this school not only have a school forest but are operating a tree nursery for planting and are successfully managing a large forest area near Commerce.

JAMES B. NEVIN, EDITOR, FRIEND OF FORESTS

In the death of James B. Nevin, editor of the Atlanta Georgian and Sunday American, Georgia lost a true friend of forestry. At the time of his death he was an officer of the Georgia Forestry Association and had rendered valuable service in promoting the work of the organization. His brilliant editorials on forestry were always informative and inspiring.

GATHER PINE SEED

The students of Vocational Agriculture in the Soperton High School, under the direction of Professor R. D. Pulliam, have gathered and cleaned five pounds each of slash and longleaf pine seed from thrifty, healthy pine trees. With these they will establish seed beds to grow seedlings for planting on the school forest.

SOUTHERN PINE SEED OBSERVATIONS

In the December, 1931, edition of the Journal of Forestry, Philip C. Wakeley writes interestingly of "Some Observations on Southern Pine Seed." Mr. Wakeley is associate silviculturist of the Southern Forest Experiment Station.

Trees differ in growth habit, gum production and susceptibility to disease, believed to be due in large measure to be inherent in seed.

Some facts brought out in the discussion are the following:

It seems highly probable that species whose habitats have mean annual temperatures ranging from less than 55 degrees to more than 70 degrees Fahrenheit, and mean annual rainfalls of from 40 to more than 60 inches, will prove of considerable importance as a source of planting seed.

By constant selection of seed from tallest trees one might in time add a log length to the average height of many stands.

A bushel of unopened cones of any of the four leading southern pines (slash, longleaf, loblolly and shortleaf) yields 0.75 to 1.50 pounds of clean seed.

The number of clean seed per pound are: Longleaf, 5,200; slash, 15,500; loblolly, 21,300; shortleaf, 69,200.

Average percentages of sound seed are as follows: Longleaf, 81; slash, 76; loblolly, 61; shortleaf, 57.

Insects take heavy toll of seed, attacking flowers and afterwards the seed. An instance of 8.5 bushels of cones collected showed only 3.5 bushels uninfested with larvae.

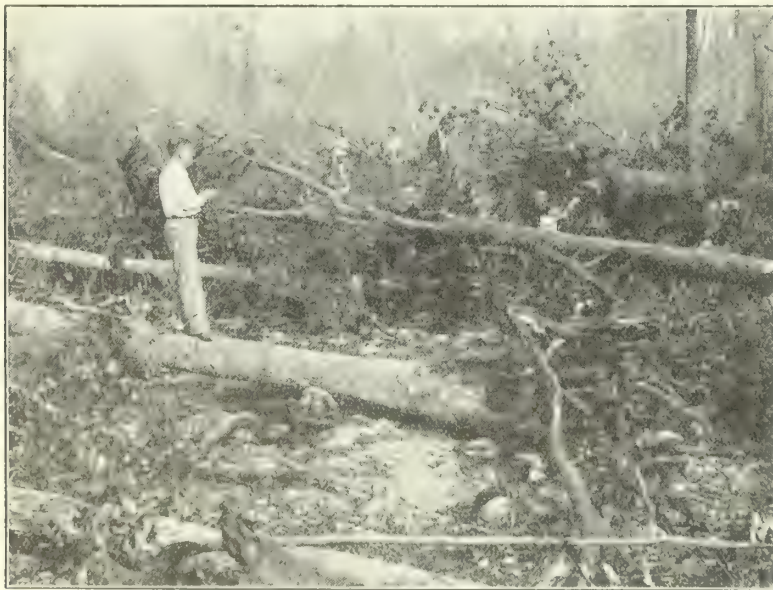
The tendency is for abundant crops to produce the greatest percentage of sound seed.

Recurrent good crops of seed are irregular and subject to many factors. Longleaf produces a heavy crop more often than seven years.

Seed stored at low temperature retain their vitality more than those stored at ordinary temperature.

Testing pine seed for germination can be carried on in standard sand flats containing clean, moderately fine, white sand, the seed covered only one-eighth of an inch, deeper covering giving less accurate results.

HOW SWAMP FIRES DESTROY FORESTS



The above illustration shows how fires in swamps of south Georgia destroy trees. When fires burn the peat soil during a drouth period, such as was experienced in the fall of 1931, the ground support is destroyed and trees fall.

Swamp fires are as rare as extreme drouths, for only when the soil is very dry is it combustible. Soil fires are very difficult to extinguish once they have gained headway. But if observed when they start, they can be checked by trenching around them. It is safer after the trench has been dug to wet the soil.

The fires of south Georgia that created so much smoke and gave the impression that the whole region was on fire were

largely confined to swamps where they smouldered for weeks, or until rains came to wet the soil.

Much valuable hardwood timber was felled by the soil fires, some of which is being salvaged before the swamps again fill up with water and salvaging becomes impossible.

The total area of national forests is 160,787,687 acres. During the fiscal year ending June 30, there were 696,870 acres added. Provisions are now being made for extending the national forest area in north Georgia by purchasing lands originally intended to be included.

TREE-A-MONTH COLUMN

by

C. N. Elliott

BLACK-JACK OAK

Of the oaks in Georgia, perhaps the most unnecessary one is the Blackjack, sometimes known as "Black Jack", "Barren Oak" or "Jack Oak". It may be distinguished by its thick, leathery leaves that are shaped like the silent weapon of a modern "hold-up" man. The name "Barren oak" may be due to the fact that this tree grows on worthless, barren lands.



BLACK JACK OAK LEAVES

The range of this tree is from Pennsylvania southward to Florida and westward to Nebraska. In the north it grows no larger than a shrub, having no commercial importance, while in the south it sometimes attains the height of 60 feet, more often 30 to 40 feet, and is used for charcoal, fuel and a poor grade of lumber.

This tree may sometimes be seen growing as an ornamental plant on the lawns of homes though it is not commonly used for that purpose. It, however, makes a very nice shade tree on account of its compact, rounded head and heavy foliage.

This tree seems to be the black sheep of the Beech family, to which it belongs. It has not the commercial possibilities of the other trees in its immediate group. At least no extensive uses have as yet been found for it.

FOREST FIRE REWARD PAID ON CONVICTION

In December the Executive Committee of the State Board of Forestry offered reward of \$100 for conviction of person violating the forest fire laws. The first claim came from Echols county on the conviction of Will White, colored, for setting fire to forest lands. The reward was claimed by J. M. Watts, who was promptly paid.

It is thought this conviction will have a wholesome effect in that region.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 2

ATLANTA, GA., FEBRUARY, 1932

No. 2

FORESTRY-GEOLOGICAL REVIEW

Enter Forestry-Geological Review. Exit Georgia Forest Lookout. This publication has expanded out of the woods into the mines, quarries and other resources of a geological nature. It is the organ of the new Department of Forestry and Geological Development instead of the Georgia Forestry Division alone.

Being a successor to the Georgia Forest Lookout, the volume and serial number of the Lookout are carried under the new title.

The purpose of the Review is to present forestry and geological information in the hope of stimulating interest and progress in the development of these two great natural sources of wealth.

Attention will be called to the progress of research in paper pulp manufacture carried on under the direction of this department. It is hoped that information appearing in this publication about the school forestry project of the division of forestry will be helpful in furthering its development. State forest-parks, roadside demonstration forests, new mineral developments and other activities relating to the department will be given space.

The readers' cooperation will be welcomed in making this a publication replete with helpful information.—Editor.

OLD FOREST FIRE

LAWS WERE SEVERE

According to Dr. Alfred Lawrence Hall-Quest, the Buddhists of Asia regarded starting fires in the forest an atrocious crime. Forest fires were used as texts for sermons. This was 400 to 500 years before the Christian era.

The Buddhists had various forms of punishment for eight cardinal sins, and each had 6 subsidiary hells. The sixth of the eight major divisions was known as "Tapana", reserved for those who set fires to the forests. The punishment for this sin consisted of impaling the malefactor on sticks and burning them.

NEW MEMBER COMMISSION J. M. MALLORY, SAVANNAH

The Commission of the Department of Forestry and Geological Development has a new member in the person of James M. Mallory of Savannah. His appointment by



J. M. MALLORY, SAVANNAH

NEWLY APPOINTED MEMBER OF THE COMMISSION OF THE DEPARTMENT OF FORESTRY AND GEOLOGICAL DEVELOPMENT

Governor Richard B. Russell, Jr., has met with wide favor. The service of Mr. Mallory to the state in the development, especially of clays of south and middle Georgia, has brought this recognition.

For several years Mr. Mallory has been industrial agent of the Central of Georgia Railroad and a recognized authority on the state's resources. The Savannah News states editorially that no more fitting appointment could have been made. A number of other papers have commented favorably on Mr. Mallory's appointment. His appointment is for a term of six years beginning January 1, 1932.

REORGANIZATION PLANS NOW IN EFFECT

Commission Outlines Plans for Divisions of Forestry, Geology and Wood Pulp Research — Bonnell Stone Made Executive Secretary of Department of Forestry and Geological Development.

The year's work of the newly formed Department of Forestry and Geological Development has been auspiciously launched. At a meeting of the Commission of Forestry and Geological Development held January 2, S. W. McCallie was chosen secretary and C. A. Whittle, treasurer and editor. Governor Richard B. Russell, Jr., is ex-officio chairman. The Commission was organized into committees for supervising various phases of work as follows:

1. Committee on Finance, Alex K. Sessions and J. Leonard Rountree.
2. Committee on Education and Utilization, C. B. Harman and member to be appointed.
3. Committee on Nursery, Forest Parks, Research, etc., Mrs. M. E. Judd and member to be appointed.

Bonnell Stone was elected executive secretary to act in an advisory capacity in promoting and coordinating the work of forestry, geology and woodpulp research and work for establishing new industries in the state. Upon his election, Mr. Stone resigned as a member of the Commission.

A budget covering three months' expenses of the main office of the Commission, the Forestry division, the division of Geology and the division of Wood Pulp Research was adopted.

The Commission did away with the offices of assistant state foresters and divided the state into eight districts with a district forester in charge of each as follows:

- First district, Rome, W. D. Young.
- Second district, Gainesville, Everett B. Stone, Jr.
- Third district, Augusta, Charles N. Eliott.
- Fourth district, Columbus, W. G. Wallace.

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Bonnell Stone, Oxford, Executive Secretary

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Gainesville

H. M. Sebring, District Forester.....Macon

C. B. Beale, District Forester.....Waycross

W. D. Young, District Forester.....Rome

Jack Thurmond, District Forester,

Savannah

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Geological Division

S. W. McCallie, State Geologist.....Atlanta

R. W. Smith, Asst. State Geologist,

Atlanta

G. W. Crickmay, Asst. State Geologist,

Atlanta

Mrs. Blanche Ransom, ClerkAtlanta

Research Division, Savannah

Charles H. Herty.....Research Chemist

George C. McNaughton.....Asst. Research

Bruce Suttle.....Plant Engineer

W. T. Allen.....Chemist

J. B. Osborne.....Plant Assistant

Fifth district, Macon, H. M. Sebring.

Sixth district, Savannah, Jack Thurmond.

Seventh district, Waycross, C. Bernard Beale.

Eighth district, Albany, H. D. Story, Jr.

The Commission authorized the state forester to employ patrolmen during the first three months of the year to aid unorganized land owners to control fires. One to three men are to be used in each of the eight districts. These patrolmen have since been employed.

Provisions were made for increasing the circulation of the Forestry-Geological Review over its predecessor, the Georgia Forest Lookout. Appropriations were allotted to the state parks, to the state tree nursery and to various miscellaneous expenses.

The main office of the Department of Forestry and Geological Development is at 425 State Capitol in one of the rooms hitherto occupied by the Georgia Forest Service.

WASHINGTON MEMORIAL WALNUTS PLANTED

Walnuts provided by the American Tree Association of Washington for planting to grow Washington Memorial trees, were distributed to 50 schools in north Georgia having school forests, in January.

The walnuts will be planted on February 22, the 200th anniversary of the birth of Washington. All of the walnuts distributed came from the estate in Virginia on which Admiral Byrd was born and reared.

INSTALLATION OF WOOD PULP LABORATORY

Force Busy at Paper Research Plant at Savannah Putting Machinery in Place With Much Work to Do Be- fore Operations Begin.

The paper research laboratories of the Department of Forestry and Geological Development are becoming a reality as fast as a corps of skilled men can install the equipment. How long it will take to complete the installation and get ready for operation, it was difficult to say in January. The machinery arrived about the middle of January, was promptly unloaded and experts began work on the foundations in the building on which the machinery is to rest. No time is being lost in pushing the installation of equipment to speedy completion.

Dr. Charles H. Herty, chemist in charge, has gathered about him an enthusiastic and highly trained staff of men. Charles McNaughton, assistant research chemist, has had many years of experience in paper production in Wisconsin and will be in charge when Dr. Herty is absent. W. T. Allen, native of Fort Valley, Georgia, another member of the staff, is a chemist with considerable experience in paper testing in the United States Bureau of Standards and in other phases of paper research work. Bruce Suttle is a skilled and experienced plant engineer. J. B. Osborne, native of Atlanta, an engineer of wide experience, is plant assistant.

As is now generally known, the object of this research work is to determine essential facts about how to successfully make white paper from southern woods. Special attention is first to be given to pines, the most widely prevalent species of tree found in the state, and then to develop the possibilities of using the most common hardwoods. The manufacture of newsprint is the first objective.

Sympathetic cooperation is being offered by the United States Forest Products Laboratory located at Madison, Wisconsin. Paper manufacturers are showing keen interest.

The funds for the laboratory are derived from a special appropriation of \$40,000 from the state, \$50,000 from the Chemical Foundation, Inc., of New York City. A building, electricity, fuel, wood and other contributions are being made by the city of Savannah. All these contributions constitute an expression of faith in Dr. Herty, chemist, a native son of Georgia, who has urged development of research along this line.

LONGLEAF VERSUS SLASH IN VALUE OF GUM

In the contribution to the Naval Stores Review, Lenthall Wyman, of the Southern Forest Experiment Station refers to data showing that the long-leaf pine produces more of the less valuable "scrape" than slash pine, saying: "A fair figure to use would be 24 percent scrape for longleaf and 8 percent scrape for slash".

Using a figure of 75,000 pounds of dip and scrape as a yield for a crop of both slash and longleaf, Mr. Wyman estimates that the value of the slash pine product with turpentine at 5 cents a pound and one and one-third cents for rosin, the returns would be \$46.75 per crop greater than longleaf. Using the ten-year average prices, the difference amounts to \$79.

Quoting Mr. Wyman: "From these figures it appears that slash has a distinct advantage over longleaf because of its low scrape yield and in the management of turpentine timber it will pay to favor slash pine from this standpoint alone. Slash pines reach turpentinizing size sooner than longleaf and yield a better grade of rosin which are additional reasons why they should be preferred."

SHALE AND BRICK CLAYS OF GEORGIA

The Ceramic Age reviewing Bulletin No. 45, "Shales and Brick Clays of Georgia", by Richard W. Smith, assistant state geologist, says in part: "This survey of the shales and brick clays of Georgia fills a distinct need for a reference work on the subject."

"The first part of the book sets forth the history of the industry, the physical properties of the various clays, and their uses while the second part covers the clays of each of the counties in detail."

"Mr. Smith's work is of great value both to the general reader interested in the mineral resources of Georgia and the ceramic manufacturer who may be considering the relative advantages of the various producing centers."

Black gum has come into extensive use especially in the Mississippi Valley for bridge flooring, cross ties, platforms, and floors for flat and gondola cars. The Southwestern Hardwood Manufacturer Club gives reports of users of black gum indicating entire satisfaction.

Dr. Frederick Bergins of Hanover Experimental Laboratories, Germany, one of those receiving the Nobel prize in 1931 discovered methods whereby solid carbon fuels, such as coal and wood, may be converted into oils and other volatile liquid adapted to heat and power production. Dr. Bergins has also discovered a method of making sugar from wood, the sugar being suitable for livestock consumption.

FIRST DISTRICT
W. D. Young, District Forester
Rome

LOW FIRE LOSS

IN NORTH GEORGIA

Although North Georgia has experienced one of the worst dry seasons during the months of October and November, when the fire hazard was greater, very few fires occurred. Especially is this true of the protected areas. Each of these areas embrace a minimum of 10,000 acres each and is a cooperative measure between the landowners and the Georgia Forest Service in fire protection.

Thirteen organizations of this nature are in North Georgia with a total area under protection of 416,728 acres. Out of this total 34 fires occurred, 1,753 acres burned over, which in terms of percentage is only 0.4 of one percent.

In view of the fact that the fire situation was extremely hazardous during the long drouth, it is very encouraging to note the interest in forest protection the organized landowners are taking as well as the landowners outside of the protected areas. It seems to point to a general improvement in the protection record for this section.

It is estimated that the area of forest land burned in October and November over North Georgia was not over 1 percent.

THIRD DISTRICT
C. N. Elliott, District Forester
Augusta

LOBLOLLY PINE GROWTH
IN DRY YEAR, 1931

Sample plots of loblolly pine established in Newton county in the fall of 1930, showed that fair growth could be made in an extremely dry year. The average age of these trees is approximately 7 years and their height averaged 12 to 20 feet, the height growth having averaged 22 inches a year.

The plots were all on the same type of land, red clay-loam of ridge tops and slopes. By aid of the cooperating landowner, the plots were kept free of fire.

The plots were thinned to the rate of 250, 700, 2,000, 3,000 and 5,000 per acre. Observations were made in December, 1931. As would be expected, the rate of individual tree growth was greatest where the number of trees was fewest and least where the number was greatest. On the plot having 5,000 trees per acre, several were found dead and dying. Even under normal climatic conditions, one would expect some trees on the thicker plots to be suppressed and die, and under drouth conditions this tendency would be expected to be accentuated.

While the trees show greatest individual rates of growth where there are fewer trees, the greatest amount of wood production is on the land with the thicker growth because of their greater utilization of the land. As the wider spaced trees become larger they will make greater use of the land and would naturally be expected to eventually produce more merchantable wood in less time than the closer spaced stand.

The following figures are taken from the records:

No. Trees per acre	Average Increase Per Tree sq. in., DBH	No. Cords In- crease per A.
250	3.05	.09
700	2.55	.19
2,000	1.47	.26
3,000	1.48	.39
5,000	.66	.30

FIFTH DISTRICT
H. M. Sebring, District Forester
Macon

Middle Georgia Audubon Society
Sponsors Fire Protection

One of the major objectives of the Middle Georgia Audubon Society of Macon is the conservation of wild life in general. The balance of all forms of wild life, that nature formerly maintained, can best be re-established by maintaining forest conditions adequate for the shelter and food requirements of the birds and wild animals. This can be brought about chiefly through the destruction of certain vermin and the prevention of woods fires.

The Audubon Society is interested in Bibb and the surrounding counties, and is planning to launch an educational campaign in these counties. The campaign will stress the importance of protecting the woods from fire for the potential timber value, the production of bird and animal life, the economic value of birds to the farmer, and the value of game to landowners.

Influential citizens and the press are sponsoring the program of the Audubon Society and the results of their activities should be of benefit to the section around Macon. The society meets on the second Sunday of each month in the Mercer University Library building. Prof. Carver of Mercer is president and was instrumental in outlining the program of the society.

SIXTH DISTRICT
Jack Thurmond, District Forester
Savannah

New Members in Liberty T. P. O.

The Liberty county T. P. O. has three new members and this new membership increases the acreage 1800 acres. Mr. W. F. Gill, Mr. H. C. Saunders and Mr. Wallace Mills were the men admitted.

Mr. W. I. Stafford the patrolman and

secretary-treasurer of the organization reports that he has finished plowing the furrows for the fire-breaks and is now busily engaged in burning out the intervening strip. He says the plowed and burned type of fire-break has proven most satisfactory and easier to construct in this section.

As we enter into the third year of protecting the timber from fire on this unit in Liberty county, the outlook for a successful season is indeed bright as more members have entered the organization and are cooperating in every way possible.

Mr. Stafford the patrolman, has done more toward preventing fire than just build fire-breaks, and patrol the area. He has visited each and every landowner and explained the work that he was trying to put over and obtained their help and cooperation. He has also written articles for the county paper, posted forest service signs over the land and carried on other educational work as well. He has slowly but surely aroused the people living in Liberty to the possibilities of growing timber as a crop.

Most of the land under protection here is practically restocked with young Slash seedlings and after the seed which were produced this year germinate the area will be fully stocked with this most desirable type of pine. All this has been accomplished by having an organization that really functions, a patrolman who has the ability and incentive to carry on all the work necessary for efficient forest protection, and by having an organization that all the people in the county are proud of and boast about.

Soperton School Forest Work
Impressive

The boys taking forestry at the Soperton High School under Professor R. D. Pulliam are intensely interested in their work and every boy wants to win the trip to the summer camp this year.

They have constructed their fire-break around the School Forest, gathered seed from both Longleaf and Slash pines, made a seed bed, and each boy has a home project to work on when he is away from school. He learns how to do the work at school on that forest and then puts it into practice on his home project.

Twenty-five Pumps Placed

Twenty-five Indian fire pumps were distributed from the Division of Forestry office in Savannah during November and December to various landowners in District 6 and orders are coming in now for more. These pumps may be obtained for \$5.75 each and every landowner should have at least one pump on hand at all times.

The demand for loblolly pine and black locust seedlings have been greater than the supply of the State Tree Nurse.

SEVENTH DISTRICT

C. Bernard Beale, District Forester

Waycross

Fire Break Demonstrations

Six fire break demonstrations with the Hester 5-disc plow and Caterpillar tractor were held in this district the first part of January. The demonstrations were attended by many interested landowners, all of whom voiced their approval of the thorough work done with this outfit.

The demonstrations were made possible through the cooperation of the State Highway Board in furnishing tractors at each point, and the Hester Plow Company. Messrs. Arthur Peacock, representing the Burgmon Tractor Equipment Company of Jacksonville, and Clarence Miles of the Yancey Tractor Company were present and assisted at each demonstration.

Mr. Peacock has three tractor and plow units operating in Wayne, Appling and Brantley counties, where considerable mileage of this type of break is being constructed.

Mr. A. K. Sessoms of Cogdell, Consolidated T. P. O., has purchased a tractor and plow and is having his lands thoroughly cross-sectioned with these breaks.

Three Patrol Districts Established on Unorganized Land

Three forest patrolmen have been employed in the Seventh Forest District and have been assigned routes in unorganized districts.

L. H. Dixon, who has actively promoted T. P. O. work in Pierce county, is working in Patrol District No. 1, embracing Pierce, Bacon, northern Ware, and eastern Coffee counties. His headquarters are at Alma.

R. D. Franklin, graduate of the University of Georgia Forest School, is patrolman in Patrol Dist. No. 2, covering Ben Hill, Irwin, and western Coffee counties. Franklin has his headquarters at Fitzgerald.

T. H. Brown, also graduate of the Georgia Forest School, is stationed in Patrol Dist. No. 3, covering Berrien, northwestern Atkinson, Cook and northern Lowndes counties, with headquarters at Nashville.

Both Messrs. Brown and Franklin have spent two summers in the West on National forests, where they found out what fires are like.

All of the patrolmen are having plenty to do and are rendering effective service in organizing attacks on fires and spotting them while they are "young".

Gaskins Thinning a Thousand Acres

J. Henry Gaskins, enthusiastic member of the Gaskins T. P. O. in Berrien county, is having a thousand acres of his lands thinned this winter. Mr. Gaskins is doing this work with the advice and suggestions of W. B. Bates, vocational teacher at Nashville.

Crowded stands of young slash pine, 15-20 feet in height, are being thinned out to about 300 trees per acre, and in addition to thinning, the lower limbs are being pruned. Mr. Gaskins has about 5,000 acres of fully stocked saplings, a splendid testimonial to his efforts in keeping out fires.

EIGHTH DISTRICT

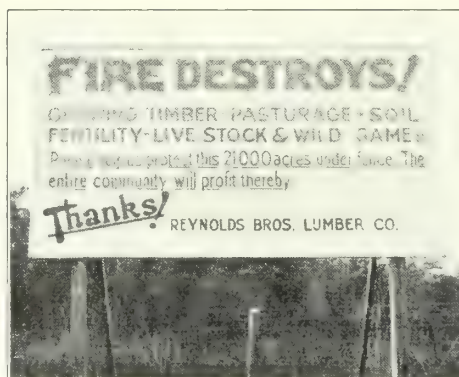
H. D. Story, Jr., District Forester

Albany

LARGE FIRE SIGNS OF REYNOLDS BROTHERS

On their protected lands Reynolds Brothers Lumber Company, Albany, have placed large fire signs 7 by 2 feet in size, on their Pine Island property, as one of their forest fire protective measures. The protected property is enclosed by a fence and at each of the six entrances a sign is placed.

The wording on the signs is excellent in its appeal and is neatly displayed. One of the signs reads as follows: "**Fire Destroys Growing Timber — Pasturage — Soil Fertility — Live Stock and Wild Game.** Please help us protect this 21,000 acres under fence. The entire community will profit thereby. Thanks. Reynolds Bros. Lumber Co."



SAMPLE OF FIRE SIGN ERECTED BY THE REYNOLDS BROS. COMPANY, ALBANY

Writing concerning the signs, Reynolds Brothers Lumber Company states: "Our purpose in putting these up is primarily to sell our neighbors on the idea of fire prevention and game preservation and secondarily to advertise to the traveling public just what they have."

The Pine Island Timber Protective Organization has completed constructing firebreaks and so far has had only about 275 acres burned over, most of this resulting from letting the fire get out of hand while burning firebreaks.

Plans for Forestry Camp

Plans for the summer forestry camp were inaugurated in January at a conference of Paul Chapman and L. M. Sheffer of the vocational department, and State Forester B. M. Lufburrow, C. A. Whittle and C. N. Elliott, of the division of forestry.

SCHOOLS GATHER FIRE STATISTICS

Report cards for use in collecting forest fire statistics have been sent to all the vocational agricultural schools of the state which are carrying on the forestry project. Over one hundred schools will list the fires in their territory, their causes and the area burned over. Some of these schools reported on areas as large as 50 square miles.

Last year these schools covered 2,619,313 acres, reporting 176,000 acres burned over, or 7 percent.

The students attending the consolidated rural schools are assembled by buses from miles around each school and the school territory is divided up among the students who make reports. The accuracy of the reports are checked by the vocational teacher. The data is used by the state forester in computing the fire statistics of the state.

The division of forestry follows up the student fire reports by sending literature on fire prevention to each person reported as having had a forest fire.

Black Locust Has Many Uses

Black locust is a 4-purpose tree, says the United States Forest Service. It quickly produces good timber for posts and other uses; it roots strongly, thereby checking soil erosion; its flowers enable bees to make a good quality of honey; and it is a legume. The nodules on its roots store nitrogen in the soil, enriching it for future crops. In addition, it is a tree of beauty and is valuable for shade.

VERY LARGE LONGLEAF PINE NEAR EASTMAN

H. C. Allen, Eastman, Georgia, recently felled a huge longleaf pine in Dodge county. It measured 16 feet in circumference at 4 feet from the ground. In its 70 feet of merchantable timber the tree scaled practically 5,000 feet board measure.

A count of the annual rings in the stump showed that the tree was practically 175 years old.

The butt cut consisting of a 14-foot log was cut into four sections each 12 by 12 inches. The second cut log 26 feet long made four pieces each 8 by 16 inches. The lumber the tree produced would make a fair-sized house.

Mr. Allen hauled the logs with heavy duty trucks. Special equipment was required to saw them. Saw mill men had hitherto failed to take this tree because they were not equipped to handle it.

The timber from the tree was sold to a railroad, the inspector classifying it as "Strictly longleaf yellow pine". The tree had very fine grain with sharp contrast in color of spring and summer wood, and had a heavy heartwood with pith almost invisible.

LUMBER PRODUCTION GEORGIA FOR 1930

The Bureau of Commerce, Washington, recently issued reports on lumber production in 1930. The year showed a decrease from 1929, when it was 1,386,250,000 board feet, because of the business depression. The record is as follows:

Number of saw mills in operation, 1,202.
Board feet cut, 753,484,000.
Board feet soft wood cut, 632,564,000.
Board feet hardwood cut, 120,920,000.
One mill cut 15,000,000 board feet.
Each of four mills cut 10,000,000 board feet.

Each of fifteen mills cut 5,000,000 board feet.

Each of 158 mills cut 1,000,000 board feet.

Each of 34 mills cut 500,000 board feet.
The softwood lumber was cut from yellow pine and cypress, mostly pine.

The hardwood production in the order of their importance was red gum, yellow poplar and oak.

The report showed an output of 99,267,000 lath and 32,466,000 shingles.

AFTER-EFFECT OF DROUTH ON PINE GUM YIELD

According to the Naval Stores Review, experienced naval stores operators say that after a prolonged drouth, such as was experienced in 1931, the yield of gum the following year is reduced. The theory is that the vitality of the tree has been lowered for the time by the prolonged drouth.

It may be added that since the water storing capacity of a soil is lowered by burning off the forest floor, it would be expected that the effect of the drouth would ordinarily be severer on burned than unburned areas.

CHEMICALS USED IN PAPER MANUFACTURE

In the manufacture of woodpulp, the following are the main chemicals used: Sulphur, limestone, soda ash, liquid chlorine, salt cake and common salt.

In the manufacture of paper from woodpulp the following are the leading chemicals used: Soda ash, alum, clay, dyes, asphalt, rosin, caustic soda, lime, liquid chlorine and bleaching powder.

The rural consolidated high school at Blackwell in Cobb county has established a school forest. Professor W. M. Putney is the vocational teacher in charge.

In getting acquainted with the duties of his office as executive secretary, Bonnell Stone made a trip with J. M. Mallory to the middle Georgia clay operations in January.

VALUE OF GEOLOGICAL PRODUCTS OF GEORGIA

Mineral Products Valued at Approximately \$15,000,000 and Water Power Income \$14,000,000 in 1930 —Marble and Slate Lead in Mineral Values.

The State Geological Survey not only locates the commercial resources of minerals and water power of the state, but it makes annual reports on the value of their output. The report for 1930, the last year for which a complete report has been made, gives the value of minerals developed at \$15,133,174 and water power at \$14,202,160, a total of \$29,336,934.

The value of the various outputs of minerals given below show both the nature and extent of the income:

Asbestos, coal	\$ 27,903
Baryte	230,769
Bauxite and Portland Cement	1,732,227
Clay, raw	2,061,209
Clay products	2,474,111
Fullers earth and Manganese	2,474,137
Granite	1,996,934
Iron ore	352,112
Lime and Limestone	428,715
Marble and Slate	2,999,910
Mica, Gold, Talc and Soapstone	97,351
Mineral Waters (estimated)	30,000
Sand and Gravel	228,396

The year 1930 felt the business depression and showed a decrease in the value of minerals and water power production, amounting to \$6,772,854 as compared to 1929.

ELLIOTT OPENS OFFICE IN AUGUSTA DISTRICT

C. N. Elliott, Covington, recently transferred from the position of assistant director of Education to district forester in the Augusta district, will make his headquarters in Augusta as soon as arrangements can be made. His district consists of Richmond, Burke, Hancock, Taliaferro, Putnam, Jefferson, Newton, Warren, McDuffie, Columbia, Lincoln, Oconee, Oglethorpe, Madison, Elbert, Hart and Clarke counties.

Piney Woods Rooters

A story told by State Forester Sonderegger of Louisiana at the meeting of state foresters is that an 80-pound razor back hog was killed in Louisiana, from which 50 pounds of turpentine, 30 pounds of meat and 5 pounds of lard were obtained.

When his attention was called to the fact that the products totalled more than the original weight of the hog, his reply was "You don't know the razor back hog".

Kiwanis Club Adds Forestry To Activities

Waycross Kiwanis club has added a new local activity to its list and appointed a Forestry Committee which is to promote forestry development. Waycross is in the heart of a great pine region and is always manifesting an interest in forestry.



MEMBERS OF COMMISSION FORESTRY AND GEOLOGY STAFF

During a conference of members of the forestry staff in the forestry office on January 5, the photographer of an Atlanta paper took a shot of the group in the state forester's office with the above result.

Among the foresters is one member of the Commission, Alex K. Sessoms, Cogdell, Ga.; Bonnell Stone, executive secretary of the Commission, and the State Geologist, S. W. McCallie.

The names, reading from left to right, front row, are: Bonnell Stone, Oxford, ex-

ecutive secretary; Mrs. R. S. Thompson, stenographer; Alex Sessoms, chairman of the Finance Committee of the Commission; S. W. McCallie, state geologist; Mrs. N. N. Edwards, secretary to the state forester.

Second row: C. A. Whittle, treasurer and editor; Everett B. Stone, Jr., Gainesville; Jack Thurmond, Savannah; C. Bernard Beale, Waycross; W. G. Wallace, Columbus; W. D. Young, Rome; H. M. Sebring, Macon; Charles N. Elliott, Augusta; H. D. Story, Jr., Albany; B. M. Lufburrow, state forester, Atlanta.

WITH THE PRESS

Stimulating Interest in Forestry

While interest in forestry is increasing some plan might be devised which would further speed up the interest. We would like to see the Chamber of Commerce, or some other civic organization, offer a loving cup and perhaps a modest cash prize to the farmer in the district having the best stand of forest kept in a state nearest to that recognized as ideal by the state forestry department. The cup might be competed for annually by the farmers.

This should broadcast the advantages of giving more attention to farm woodlands and teach farmers how they can improve their own forests, and care for them.—Columbus Enquirer-Sun.

"A Romance of the Old South" Stays in Demand

As showing the widespread interest in the naval stores industry, it is pointed out that the little pamphlet issued by Mr. H. J. Rolls, of the Rolls Chemical Company, Buffalo, N. Y., entitled "A Romance of the Old South," telling briefly the story of the production of turpentine and rosin in the South, has had a wide circulation and is being continually called for by those who desire to be better posted about this, the oldest of American industries. The naval stores industry has too long kept its light "under a bushel," and probably its troubles may be to some extent due to that fact. "A Romance of the Old South" helps to educate.—Naval Stores Review.

Forest Revenue

The fact that forests are as capable of yielding revenue as are other products of the soil has led to such a vast depletion of Georgia's timber resources that the Georgia Forestry Department's work of forest conservation, has had an uphill fight for recognition, since profit has been counted chiefly in the felling of trees to be sent to the sawmills.

The Georgia State Forestry Department reveals the fact that the total revenue from products cut from Georgia forests in 1929 amounted to more than \$60,000,000; but wholesale destruction of timber growths has been shown by experience in many regions to be a positive lack of thrift, while forest conservation has been demonstrated to be profitable under wise direction.

Georgia has the largest timbered area of any state in the Union, with a total of more than 23,000,000 acres, and if our people are wise they will take all necessary steps to present its diminution.—Atlanta Georgian.

"Selling" Fire Breaks

Following the disastrous attack of forest fires in South Georgia, which has brought a new and increasing interest in protective

methods that will save the valuable pine timber lands from destruction at the hands of the red menace, an ingenious plan of "selling fire breaks by the mile" has been launched in the Waycross district.

Using a "thirty" crawler type tractor and a five-disc plow, an outfit is now operating in southeast Georgia, constructing firebreaks at \$3 per mile, according to District Forester C. B. Beale, with headquarters in Waycross.

While the work is not being done by the Georgia Forest Service, but is strictly a private enterprise, the type of work has met the approval and recommendation of the Forest Service staff, according to Mr. Beale.—Quitman Free Press.

South Georgia's Timber Outlook

South Georgia, lying in an area where the pine reproduces with amazing rapidity and comes to a maturity where it can be both turpentine and used for paper pulp with a much shorter time than in any other section in the world, should materially profit by reforestation. The time will come when the people of South Georgia will find the various products of the forest the surest, most stable and possibly the largest source of their income.

Proper reforestation and proper methods of protection for the wide acreage now devoted to forests will return large dividends in years to come.—Valdosta Times.

Success of Arbor Day

The very general observance of Arbor Day in the public schools yesterday and by others who are interested in having the City of Savannah retain its designation as the Forest City was most pleasing and in every way commendable.

It is a very fine thing to plant a tree and it is equally as fine to instill into the minds of the youngsters in the public schools the idea of beautifying the surroundings thru the addition of growing things that make gardens and yards and playgrounds more beautiful as the years pass. The natural bent of youth is too strongly in the direction of destruction; to carry to the juvenile mind the belief that it is better to foster and build and develop than to tear down implants such thoughts at a time when an impression is made that lasts throughout not alone the youth, but the more mature years of the pupils whose thoughts are directed thus. Trees planted in school yards amid a ceremony in which the pupils have a part make such events memorable in the minds and memories of the young actors who participate in the planting.

Joyce Kilmer was right when he said only God can make a tree, but we mortals can take a tree that God through His goodness has made and place it where its usefulness will be much enhanced and magnified. And to see that this is done is one of the offices of Arbor Day.—Savannah Press.

GUM FROM BURNED

LONGLEAF PINE

How long does it take for a longleaf pine to come back in gum production after a forest fire?

Dr. Eloise Gerry, of the United States Forest Service, who studies the gum production of pines in the south, reports some results with longleaf where foliage was burned, and found that it took three years to get back to normal. The following is a quotation of the summary of her studies:

"A winter fire, which killed the foliage but not the buds of a group of 10 young longleaf pines, resulted in a loss in the turpentine stand of over 50 percent of the test trees, either by killing them outright or by causing them to cease to exude oleoresin.

"The trees that survived the scorching showed a markedly reduced yield of oleoresin in the first year after the fire. They, however, recovered so that the yield of oleoresin per streak per tree increased during the next two years even under the exploitation of ordinary commercial turpentine. During the second and third years after the fire the scorched trees that survived, yielded tree for tree practically as much oleoresin as unscorched trees.

"The damage done by the scorching of the tops of the trees was plainly evident in the structure above the turpentine face in the injured trees, where the enfeebled wood formation was markedly less than the wood formation in the unscorched trees. This reduction consisted chiefly of missing annual growth rings, poorly developed summer wood, and reduced oleoresin-yielding tissue. Yet these enfeebled trees, which survived the 1927 scorching and responded to commercial turpentine in 1928 and 1929 with a comparatively high yield of oleoresin, were able also to make an appreciable gain in wood formation in 1929, thus giving a striking demonstration of the potential energy and recuperative power of longleaf pine."

RESULTS OF LOWER CHIPPING REPORTED

Dr. Eloise Gerry of the Forest Products Laboratory, Madison, Wisconsin, has issued a bulletin entitled "Improvement in the Production of Oleoresin Through Lower Chipping." The results of considerable work by Miss Gerry in the South is recorded in this bulletin. The main fact is that she has shown that lower chipping, that is, narrower streaks, are more economical than the "streak" ordinarily cut by the turpentine operators. The total yield of a tree is greater and the operations are extended longer because less "face" is covered each year.

Fires not only destroy food for quail but they remove their coverage so that their natural enemies, hawks, foxes, etc., play havoc with them.

WASHINGTON TREE MEMORIALS URGED

The American Tree Association has been urging the planting of trees as a memorial to George Washington on the occasion of the 200th anniversary of his birth this year. Wide-spread interest has been created and already a vast number of trees have been planted.

In Georgia a number of trees have been planted and many more will be planted during February. Schools should sponsor the planting of Washington trees on the school grounds or near by. Appropriate exercises should be conducted.

Most of the plantings are of the shade tree species. Water oaks, willow oaks, live oaks, sycamores, yellow poplars, red gums, pines of all kinds native to the state, red buds, black locust, cedars, hackberry, are among desirable native trees for planting.

The hardwoods can be successfully planted when fairly good sized but the pines and cedars must be planted when very small and with particular care. Instructions about planting pines and hardwoods can be obtained from the Division of Forestry at the State Capitol.

It will be unfortunate if proper care is not taken in planting memorial trees. A dead memorial tree, of course, is a travesty. Those who contemplate plantings are urged to get thrifty trees, take good care that their roots do not dry out; plant in an opening big enough not to cramp the roots; prune the trees properly and otherwise follow good practices.

Barren Fire Breaks

The Michigan Conservation Department has begun actual tests with a chemical mixture that it is claimed will keep fire breaks free of vegetation so that they will not have to be renewed every year. The material is the outcome of several years' experiment. Information will not be made public until the present tests are completed.

WHITE PAPER MAKING IN SOUTH DISCUSSED

On January 28, Dr. Charles H. Herty, who directs the chemical research in paper manufacture under the Department of Forestry and Geological Development, at the Laboratory at Savannah, spoke before the Technical Division of the Canadian Pulp and Paper Association at Montreal. The subject assigned for his address was "Manufacture of White Paper in the South."

A farmer sitting on his porch was watching a forest fire on his neighbor's land. A forest fire patrolman rushed up and asked, "Why ain't you fighting the fire?"

"Not on my land," said the farmer.

"It will make your well go dry," said the patrolman.

The farmer reached for a hoe and lit a fire for the fire.

DR. HERTY HONORED BY CHEMICAL SOCIETY

American Chemical Society Awards Medal to Georgian for Outstanding Contributions to Science.

The American Institute of Chemists has designated Dr. Charles H. Herty to receive a medal of award for "noteworthy and outstanding service to the science and profession of Chemistry in America". This announcement was recently made by Frederick E. Breitu, president of the institute.

Last year the medal was awarded Andrew M. Mellon and his brother, Richard B. Mellon, and among other recipients in previous years were George Eastman and Mr. and Mrs. Francis P. Garvan.

Dr. Herty, as is well known to Georgians, is a native of this state, a graduate of the University of Georgia, former member of the state university faculty; developer of the Herty cup that revolutionized the turpentine industry and is now in charge of research work in wood pulp from southern wood for which a laboratory has been established with funds provided by the state and the Chemical Institute Incorporated, of New York.

Important discoveries indicating the adaptability of slash pine to the manufacture of white paper is among his achievements. He was formerly president of the American Chemical Society and has promoted a number of legislative movements to foster chemical advancement in this country.

The Department of Forestry and Geological Development of Georgia is, of course, proud to have one so honored on its staff.

Farmers Week at the State College of Agriculture at Athens, emphasized forestry in land utilization. Most of the speakers dealing with the subject proposed tree planting for idle acres.

Prominent T. P. O. Member

It looks like a prominent member of a Timber Protective Organization of Georgia will be a candidate for president of the United States. The Honorable Franklin D. Roosevelt is referred to.

Forest Fire Pumps

At each of the following forestry offices, forest fire pumps shipped on consignment by manufacturers, can be purchased at a cost of \$5.75. These are 5-gallon pumps fully equipped. A number have already been sold.

"Seedlings planted so that their tap roots curl up, are much more likely to die than those with their tap roots straight," says B. F. Grant of the State Tree Nursery.

SALE CITY BOY IS DOING PRACTICAL FORESTRY WORK

Bill Crosby Says Every High School Boy Should Be Interested in Trees.

(From Albany Herald)

SALE CITY, Jan. 23. — "Every high school boy in Georgia should be interested in growing trees," says Bill Crosby, student of vocational agriculture in Sale City Schools. His statement is being borne out by the work he is doing on his home farm.

Bill is carrying on quite a bit of practical forest work on his home farm, including protecting his father's forest land from fires, building of a pine seed bed and carrying on a forest project of five acres.

In protecting his father's forest from fire, Bill has built fire breaks sufficient to protect the woodland. This was done by raking and burning a strip 30 feet wide around the places offering the greatest danger to fire.

In order to have a sufficient amount of young pine for planting, Bill has made a pine seed bed which will supply him several thousand plants. For doing this he collected 20 pounds of slash and longleaf mass last fall.

The five acre plot that Bill has as his forest project is part of an old field and has a good stand of slash pine on a part of it. On this he has thinned to a uniform stand the part where young pines are growing. On this part he has also estimated the value of marketable size trees. On the part not containing a stand, he is planting young pine trees according to the specifications of the Georgia Forest Service.

Besides his forest project work, Bill carries on a project work as a part of his agriculture course. He takes a very active part in the local Chapter of F. F. G. It will be well to remember that Bill was the champion peanut grower of the United States, winning the sweepstakes prize at the Chicago International as a 4-H Club boy.

ADVOCATES CONVICTS FOR REFORESTATION

The Manufacturers Record, Baltimore, has recently advocated the use of convicts for reforestation and says in the course of its discussion:

"Convict labor recently was used by Pennsylvania in reforesting a large area in the neighborhood of the Western Pennsylvania State Penitentiary. Such public work, offering the least competition to free labor, should be of great value in the carrying on of a conservation and development program that otherwise could not be done under prevailing conditions."

SPRING FIRE SEASON WORST OF YEAR

Farmers Careless in Burning Around Fields in Late Winter and Spring, Let Fires Get Into the Woods.

The late winter and spring months are times of danger for the forests. In preparing for breaking land many farmers are accustomed to burn off the previous season's debris, and to clean up around the edges of fields with fire. This is why more forest fires are started in late winter and spring than at any other time.

If farmers find it necessary to do any burning, it will not require much effort to confine the flames to the fields. Instead of starting fires at the borders of the field the trash to be burned can be drawn into the open so that the fire will not spread flames into the woods.

Field fires should be watched. Too often they are started late in the afternoon and are not watched until they are out. What at times looks like a safe fire may suddenly become a menace by a breeze that whips up suddenly. The safest way is to consider all field fires dangerous until they are completely out.

Not only is carelessness in handling field fires too frequent but worse still is the widespread indifference to the fire after it gets into the woods. The growth of trees is set back if the trees are not killed outright, the fertility of the soil is impaired, the regular flow of streams is lessened—everybody loses and no one gains.

It will doubtless be appropriate to reproduce here Georgia's Forest Fire Law. It is as follows:

EXTRACT FROM CODE OF GEORGIA LAW 1910

As Amended Aug. 8th, 1927

ARTICLE 2

Firing the Woods.

SEC. 227. WHO MAY. No person but a resident of the county where the firing is done, owning lands therein, or domiciled thereon, outside of any town incorporation, shall set on fire any woods, land or marshes, nor shall such persons, except between the first of February and the first of March annually.

SEC. 228. NOTICE. When such person shall desire to set fire within a said time, he shall notify all persons who occupy lands adjoining him, by residence thereon, or cultivation, or enclosure of any portion of the tract or settlement, of the day and hour of the firing, at least one day prior thereto. Such notice need not be given if, on sudden emergency, due caution should require firing to render one's premises safe.

SEC. 229. PENALTY. Any person setting fire violation of the preceding sections shall be guilty of a misdemeanor.

SEC. 230. PENALTY FOR LETTING WOODS CATCH, ETC. Persons, either by themselves or agents, who permit fire to get into the woods, lands, or marshes, through neglect, are within the meaning of the three preceding sections.

STUCKEY AND NEWTON PROMOTE FORESTRY

Pioneer Work in Reforestation in Spalding County—Oldest Loblolly Pine Plantation in State.

(From Griffin News)

Two prominent Griffin men—Will Hill Newton and Dr. H. P. Stuckey—have received high commendation from state and federal forestry officials for their splendid activities during recent years in reforestation and forest conservation.

Mr. Newton is one of the pioneers in the reforesting movements in the state and Dr. Stuckey, director of the Experiment Station here, has given the cooperation of himself and the experiment station toward furthering the movement.

A special federal fund of \$5,000 annually to finance plantings of white and Chinese chestnuts in north Georgia as an experiment was secured largely through efforts of Dr. Stuckey and Georgia friends of forestry.

Mr. Newton, with the cooperation of the forestry division of the State College of Agriculture and the personal assistance of Dupre Harrett, extension forester, is now planting 22,000 seedlings of longleaf and slash pine on several of his farms in Spalding county.

A special 10-acre plot just south of Griffin, with 1,640 feet of road frontage has just been planted in longleaf pine seedlings and is a special gesture in connection with the national bicentennial movement next month in honor of George Washington.

Honor Washington

Mr. Newton is one of the pioneers of the reforesting movement in Georgia. Some thirty-odd years ago, Captain Seaton Grantland, father of Mrs. Wilbur Barnes, planted

just south of Oak Hill cemetery what is known as the oldest plot of planted loblolly pines in the entire United States. In this work of artificial planting, Mr. Newton is said to be Number Two in Spalding county while in Pike county where he also has a farm, he is said to rank as Number One in this line. He is practicing progressive forestry methods and reforestation. He already has several areas of longleaf pine, artificially reforested several years ago, and some of his seedlings have now attained a height of five or six feet.

Mr. Newton plans his work from year to year and is looking forward to continuing this good work in the near future. It is to be hoped that more people will become interested in the utilization of worn-out land for this purpose of raising timber and its products.

Forestry Society Officers

At the annual meeting of the American Society of Foresters held in New Orleans during the Christmas holidays, the following officers were elected to serve for 1932 and 1933:

President—M. C. Granger, Forest Service, Washington, D. C.

Vice-President—John D. Guthrie, Forest Service, Portland, Oregon.

Council Members for four years—E. L. Demmon, Southern Forest Experiment Station, New Orleans, La.; C. F. Korstian, Duke University, Durham, N. C.; Hugo Winkler, University of Washington, Seattle, Wash.; A. F. Hawes, State Forester, Hartford, Conn.

T. G. Woolford, president of the Georgia Forestry Association, was recently advanced from the presidency of the Atlanta Retail Credit Company to chairmanship of the board of this important concern.



STUDENTS LEARNING TO ESTIMATE STANDING TIMBER

One of the activities of the vocational students of rural consolidated schools having an agricultural vocational teacher and a school forest, is estimating the volume of

standing timber.

The above is a photograph of a group of students making estimates of the board feet of standing timber in a school forest.

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DEPARTMENT OF FORESTRY AND
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No. 3

NEW TREE NURSERY ESTABLISHED AT ALBANY

Pines Adapted to South Georgia Conditions to Be Grown in Nursery Near City of Albany.

At a meeting of the Commission of the Department of Forestry and Geological Development, held in January, it was decided that one or more state tree nurseries should be established in the state, to be operated by the Division of Forestry.

In pursuance of this action, a site was selected by the forestry committee of the Commission at Albany, where it is the purpose to grow pines of South Georgia under their natural climatic and soil conditions. Slash, longleaf and loblolly will be the principal output.

The city of Albany and the county of Dougherty are cooperating in providing the site and water for the nursery. The nursery is located on the county farm on a public highway.

The local district forester is in charge of the nursery and has been busy getting pine seed and planting. Seedlings for planting will not be available for planting until the first season's growth is attained.

Funds for operating the nursery are obtained, in part, from federal sources under the Clark-McNary Act.

FAVORABLY IMPRESSED WITH FORESTRY PROGRESS

A. B. Hastings, in charge of public relations, and Charles F. Evans, district inspector, of the United States Forest Service, visited Georgia in February and, in company with State Forester B. M. Lufburrow, and Development Agent Bonnell Stone, made a tour of timber protective organizations in various parts of Georgia.

These officials supervise the expenditure of Clark-McNary federal funds for fire control and the state tree nursery. They expressed gratitude over the showing made in Georgia, particularly in the formation of new timber protective organizations, the new acreage added to old organizations and the way the timber owners are carrying on with timber protection in spite of the business depression.

CAPTAIN I. F. ELDRIDGE TO FORESTRY SERVICE

Captain I. F. Eldredge, Fargo, Georgia, has accepted a position with the Southern Forest Experiment Station, New Orleans, Louisiana, and is to have charge of forest survey work of the South, recently authorized.

For several years, Captain Eldredge has been in charge of the forestry holdings of the Superior Pine Products Company in Clinch and Echols counties, consisting of about 225,000 acres, the largest area of private ownership in the South. Previous to taking over the management of the Superior Pine Products land, Captain Eldredge has been connected with the United States Forest Service for several years.

In the departure of Captain Eldredge, Georgia loses one of its leading commercial foresters and one of the ablest promoters of forestry in the State. His success has been pointed to with pride, and his work was the object of favorable comment on the occasion of the visit of state foresters of the nation last year.

Captain Eldredge has been an active supporter of every movement looking to the advancement of forestry in Georgia, and was in frequent demand for addresses at forestry meetings. His headquarters will be in New Orleans.

The successor to Captain Eldredge in the organization of the Superior Pine Products Company has not yet been chosen.

MISS ALICE BAXTER, FORESTRY PIONEER, DIES

The first woman member of the State Board of Forestry of Georgia, Miss Alice Baxter, of Atlanta, died on February 13. Miss Baxter was appointed to the first State Board of Forestry by Governor Clifford Walker, and was the representative of woman's clubs of the state, required by the law.

Miss Baxter was chairman of the forestry committee of the State Federation of Women's Clubs and one of her last official acts was an appeal to clubs of the state in behalf of forestry, and especially for tree planting.

In her death, the cause of forestry has suffered a severe loss.

ANNUAL MEETING GEORGIA FORESTRY ASSOCIATION

Session to Be Held at Rome, June 22-23 — Program Committee Arranging for Array of Prominent Speakers to Handle Important Subjects.

At a meeting of the executive committee of the Georgia Forestry Association held in Atlanta, Friday, February 12, it was decided that the annual session of the organization would be held at Rome, June 22 and 23.

A committee was appointed to arrange the program. This committee consists of Bonnell Stone, Oxford, chairman; President T. G. Woolford, Atlanta; Mrs. M. E. Judd, Dalton; Jack Williams, Waycross; J. A. Davis, Albany; C. B. Harman, Atlanta; Wyatt Foster, Rome.

It was decided that a day and a half of the program would be given to addresses and that the afternoon of the last day would be devoted to demonstrations conducted by the Division of Forestry.

An invitation is to be extended to a member of the executive committee of the Southern Forestry Conference to appear on the program and to hold an executive committee meeting of that association to discuss the feasibility of reviving this southwide forestry organization.

Exhibits are to be displayed and forestry in North Georgia is to be featured from many standpoints.

In view of the threefold activities of the new Georgia Department of Forestry and Geological Development, under which forestry activities of the state are now conducted, it was decided that not only forestry but paper pulp research and geology would be given recognition on the program.

Rome will entertain the Association for the first time. Meetings will be held in its handsome city auditorium. A hospitable welcome will be given by this enterprising city of several hills, the only city of Georgia making rayon silk out of wood, a city of educational renown and the center of a region of vast forest and mineral resources.

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PLANS FOR DEVELOPMENT OF STATE FOREST-PARKS

Plans are under way for the development of the Vogel and Indian Springs State Forest-Parks. The Vogel State Forest-Park embraces 160 acres and is located on top of the Blue Ridge in Union and Lumpkin counties, and includes the top of Blood Mountain, one of the highest peaks in the State, and two pretty waterfalls. The State Forest Service has extensive plans for the development of this area for recreational use and the demonstration of what is good forestry practice.

The Indian Springs State Forest-Park, embracing 22 acres, is situated in Butts county, and includes the well-known spring which is of much historic interest, it having been deeded to the State at the time of the famous McIntosh treaty with the Creek Indians. This area is being developed primarily for recreational use, but the idea of fire protection and proper methods of handling woodland will be brought out.

Both of these areas were visited by a large number of people last year, and it is expected that they will be visited by still larger numbers during the present year. Active construction work on both of these areas will begin in a short time, and it is hoped that they will be considerably improved by the opening of the summer season.

E. B. STONE, Jr.

PINE PLANTING PROGRESSES —REFORESTATION POP- ULAR IN GEORGIA

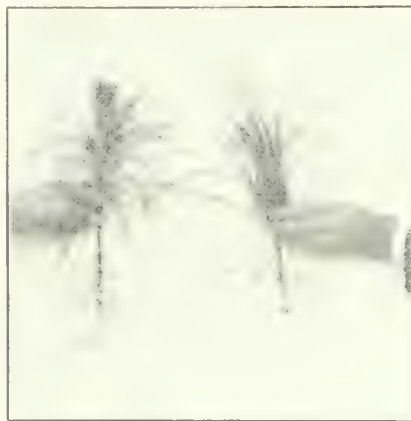
Slash and Longleaf Pines Planted in South Georgia in Both Fall and Spring—Year-Old Seedlings Used.

Tree planting in the state occurs in the spring, though considerable planting of pines is carried on in South Georgia in the fall. Last fall South Georgia was in the midst of an unprecedented drouth and planting was deferred in many instances until late winter or spring. Fall planting in North Georgia is not advisable, principally because the small pine seedlings set out at that time are often subjected to heavy freezes that heave them to the surface, leaving their roots to dry out, which in turn results in the death of the seedlings.

More slash and longleaf pines are planted in Georgia than other species. These, of course, are the species that yield naval stores as well as lumber, poles, cooperage, cross ties, shingles and pulpwood that other species of pine produce.

As a rule plantings of one-year-old seedlings are made. Transplanting older pines is likely to result in heavy mortality. Special care must be taken to keep the roots moist from the time they are taken from the seed-bed until they are transplanted to the ground where they are to remain.

A few simple rules are to be followed. In South Georgia the seedlings should not



On left—One-year-old slash pine seedling.
On right—One-year-old longleaf pine seedling.

be planted quite as deep in the ground as they were when taken from the nursery bed, so that drifting sand will not get into the crowns. In North Georgia they can be planted at the same depth that they were in the nursery. It is better to plant when the soil is fairly moist. In that case, no water need be applied.

Plowing furrows along the line of planting is advisable, both for lining up of trees and for preparing the soil for easy planting.

Those who want full details for planting pines and other trees should write the State Forester of the Department of Forestry

and Geological Development and ask for bulletins on planting and also for pine seedlings, if they are needed.

COMPLIMENTARY TO BONNELL STONE

Mr. Bonnell Stone, development agent of the Department of Forestry and Geological Development, has changed his residence from Blairsville to Oxford, Georgia. As a token of appreciation of the years of service in upbuilding the region around Blairsville, a number of leading citizens of Union county presented him with a very valuable watch. Mr. Stone is now residing in the home formerly occupied by his grandfather at Oxford, the place where his father and grandfather have been connected with Emory University.

FORESTRY RECOGNIZED IN EDUCATIONAL ASSOCIATION

Forestry Recognized as Section of Southern Agricultural Workers Association.

At the annual meeting of the Southern Agricultural Workers Association held at Birmingham, Alabama, February 2, 3 and 4, a sectional meeting in the interests of forestry was held with Fred B. Merrill, state forester of Mississippi, presiding.

Forestry's part in land utilization, forestry in agricultural schools, soil erosion and forestry, timber marketing and forest production problems were discussed.

Resolutions adopted emphasized soil erosion studies, greater recognition of forests in land utilization, extension of the forestry project with vocational schools similar to that inaugurated in Georgia, and in favor of considering forestry production in the annual southern meetings of the Federal Bureau of Economics where the "Southern Outlook" is formulated.

In an effort to increase the attendance of foresters at the annual meeting of Southern Agricultural Workers, it was decided that sections of the Society of American Foresters in the region nearest the meeting place, be urged to hold their annual meeting at the time and place of the session of Southern Agricultural workers.

The following were elected as officers of the forestry section for the year: President, E. L. Demmon, director of the Southern Forest Experiment Station, New Orleans, Louisiana; Secretary, D. E. Lauderburn, Extension Forester, Jackson, Mississippi.

Teacher—"What do you understand by the word 'deficit', Johnny?"

Johnny—"It's what you've got when you haven't as much as you had when you had nuthin'."

GEORGIA INDUSTRIAL COLLEGE FORMS FOREST CLUB

F. B. White, Vocational Agriculture Teacher at the Georgia Industrial College, Barnesville, Initiates Forestry Club Among Students.

One of the progressive and outstanding vocational agriculture teachers of the state is F. B. White, of the Georgia Industrial College, Barnesville, who has been among the leaders in promoting the forestry project and has organized a forestry club. He has worked out the complete details governing the activities of the club. An outline of the organization has been obtained from Professor White, which is as follows:

1. ORGANIZATION.

- The name of this club shall be **G. I. C. Forestry Club**.
- The purpose of this club is as follows:
 - To equip members with the ability to appreciate the forest.
 - To learn how to handle the woodland on the farm on which we live.
 - To participate in reforestation and fire-prevention work.
 - To co-operate with the Georgia Forest Service in every way possible.
- The meetings shall be held on Tuesday of each week in the forestry class room at 11 o'clock in the morning.
- There shall be hikes at least once a month and a picnic in the spring.
- Each member shall be required to have a home forest project of at least three acres.
- Each member of this club shall take an active interest in the school forest project and help carry out the plans of the Georgia Forest Service.
- The club will participate in "Forest Week" and "Arbor Day" with appropriate programs.
- Before becoming a member, a student must manifest interest in forestry and meet the following tests:
 - Identify and describe at least 20 forest trees.
 - Give the principal causes of forest fires.
 - Demonstrate how to build a fire break.
 - Know what a Timber Protective Organization is and how it operates.
 - How many species of trees in Georgia and acreage in forest land. There shall be no cost to this club, but each member will be expected to bear his part of expenses in the annual picnic.
 - There shall be three degrees in this club to be attained as a member becomes more proficient in forestry.
 - The following tests will be required for the second degree:
 - Identify 10 of the commercial woods.
 - Give uses of these 10 woods.
 - Collect tree seeds of three species of trees.
 - Prepare and plant a tree seed bed.
 - Do fire patrol work.
 - Know three insects of the forest.
 - Know the different kinds of fires and how to fight each kind. This degree will be known as Wood-crafter Degree.

- Those members who have passed the first two degrees and meet the following tests will be known as Junior Foresters.

- Demonstrate ability in forest fire protection.
- Demonstrate ability in estimating standing timber.
- Demonstrate ability to scale logs.
- Rendered some practical service to timber owners.
- Average 90 or more in forest subjects.

- There shall be a President, Vice-President, Secretary and Reporter, each officer to be elected for one semester.

B. ACTIVITIES.

- The following activities shall be studied:
 - Tree study.
 - General forestry.
 - Study of forest products.
 - Study of woods and wood products.
 - Game protection and propagation.
 - Recreation.
 - Forest protection.
 - Public education.

C. CALENDAR OF CLUB ACTIVITIES.

The activities of each month shall be agreed upon and stressed according to their importance. The various activities shall be grouped to fit into the seasons as near as possible. Such jobs as tree planting, woodland management, fire prevention, co-operation with the Georgia Forest Service, and all phases of woods work shall be emphasized to its fullest extent.

D. REFERENCE MATERIAL.

This club shall secure all the available literature on forestry, such as books, bulletins and other publications, and study these references. A list of all available material will be found in the forest library of the school.

MINIMUM DIAMETER OF PROFITABLE SAW TIMBER

The Forest Products Laboratory of the United States Forest Service has made careful cost studies of lumber production from different size logs. From a recent issue of "The Log of the Lab," issued by the laboratory, the following is taken:

"Forest Products Laboratory logging and milling studies show that in any lumbering operation there is a minimum size of tree which just pays its way through the mill; smaller sizes are cut at a loss. Not only is it more costly to handle small trees than large ones, but the lumber sells for less per foot when cut. Analysis of studies completed since our last report on this subject gives the following smallest sizes that should be taken for maximum immediate profit per acre logged: In Arkansas second-growth forest shortleaf and loblolly pine, 12 inches; in Louisiana, old-field loblolly, 15 inches; in Virginia, second-growth forest loblolly, 12 inches; in North Carolina old-field loblolly, 11 inches; in Texas and western Arkansas, virgin shortleaf, 10 to 14 inches, according to type and age of stand.

"To insure a profitable second cut in the relatively near future, the commercial operator should work to larger minimum diameters than the above."

LOG AND STUMPAGE PRICES REPORTED

According to Statistical Bulletin No. 37-S, published by the United States Forest Service, 78 per cent of the standing timber reported as sold in 1930 was virgin timber, 17 per cent was second growth, and 5 per cent was of mixed origin and second, or "culled," virgin stands. Ninety-three per cent of the logs reported sold in 1930 were intended primarily for manufacture into lumber, the other common uses of logs, such as veneer, ties, box shooks, etc., accounting for only a small proportion of the total.

A comparison of stumpage and log prices for 1930 and 1929 shows a general decrease in 1930 of 13 per cent and 10 per cent respectively. The average wholesale price of twelve representative lumber items shows a decrease of nearly 8 per cent in 1930, and the average price paid by contractors for six representative lumber items in eight representative cities, shows a decrease of nearly 4½ per cent in 1930 as compared to 1929.

INCOME FROM FORESTS STEADIER THAN FROM CROPS

Decline Only 7 Per Cent Compared to 47 Per Cent for Cotton, 46 Per Cent for Corn and 42 Per Cent for Wheat During Depression.

Forests yield a farm income that shows little decrease during the depression as compared to the incomes from agricultural crops.

The Bureau of Agricultural Economics of the United States Department of Agriculture recently issued data on the farm value, gross income and cash income from production for the years 1929-'30.

The decrease in gross income from forests in 1930, these data show, was only 7 per cent below that of 1929, while the decrease in total gross income from farms was 29 per cent.

If we compare the gross income from forest with the gross income from cotton, we find that while it is only 7 per cent for forests, there was a decline in gross income from cotton in 1930 of 47 per cent compared to 1929. The decrease in corn for the same period was 46 per cent and for wheat 42 per cent. Comparisons with other farm incomes emphasizes the fact that forest products are subject to less price fluctuations than farm incomes in general.

This is to be explained largely by the fact that forest products can be harvested at any time and in accordance with demand, whereas farm crops in general must be harvested annually and can easily create a marketable surplus.

This advantage of forests over agricultural crops adds an element of safety to investments in forests not enjoyed by agricultural crops.

FIRST DISTRICT

W. D. Young, District Forester
Rome

Effective Fire Control

Patrolmen in District 1 have been successful in keeping fires out of the patrolled areas up to date.

Mr. C. S. Fowler, who is patrolman in a section around LaFayette, including parts of Walker, Catoosa, Whitfield and Chattooga counties, reports that only three small fires have occurred, which were promptly put out. Most of the landowners are interested in keeping fires out of their timber and are co-operating with him in fire suppression. Educational work is being carried on by personal contact, by visiting rural schools wherever possible. Posters calling attention of the public to possibilities of forest protection are being posted. Agricultural county agents are cooperating with the patrolman in carrying out his work.

Mr. W. A. Johnson, who is patrolman in a section around Jasper, Ga., including parts of Gilmer, Pickens, Gordon, and Murray counties, reports that no fires have occurred in his section, to date. This is due partly to the rainy weather and to the educational and publicity work being put on in that particular section. Every effort is being made by the patrolman to carry out his work to the best advantage.

District 1 is fortunate in having two men as patrolmen who are widely known in their respective areas. By these men living in the patrolled areas, they are able to make effective contacts with the landowners.

SECOND DISTRICT

Everett B. Stone, Jr., Dist. Forester
Gainesville

Forest Fire Patrolmen in Gainesville District

The first of February two forest fire patrolmen were appointed on fire control duty in the Gainesville district. Mr. W. B. Meaders was assigned an area embracing all or parts of Hall, White, Dawson, Gwinnett, Forsyth and Lumpkin counties. Mr. F. H. Williamson was assigned an area embracing all or parts of Banks, Jackson, Habersham and Barrow counties.

These patrolmen have been provided with tools and equipment for extinguishing fires. They will work with the landowners in preventing the occurrence of forest fires, and assist them in suppressing fires where they do occur.

A small number of fires have already been suppressed in both of these units by the patrolmen, and it is believed that they will, by securing the cooperation of the landowners, reduce the number of fires and the areas burned over.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

School Aids Farmers at Carnesville in Planting Pines

Franklin County High School, under the direction of Carl Parker, vocational teacher, is planting pine seedlings for farmers in the county. Mr. Parker estimates that the forestry club will plant some twelve thousand seedlings within the next three weeks.

Students Improve Memorial Forest

Work on the Nancy Hart Forest-Park, donated last year by the Stephen Heard and Nancy Hart chapters of Daughters of the American Revolution to the state organization, and embracing some five acres in the southeastern corner of Elbert county on Warhatch Creek, is progressing nicely under the supervision of the forestry club at Nancy Hart Memorial school at Fortson. F. M. Young, vocational teacher, and his students, have thinned a greater portion of the forest and are planning to cut out a road to Nancy Hart's homesite on the place.

Patrolman's Experiences

Forest Patrolman E. L. Stephenson reports the attitude of all landowners in his territory is that they do not want fires on their forested areas and are working to keep them out. Most of the fires, he has learned, are put out quickly after they are discovered. The landowners instruct their tenants to keep fires out of their forests.

A number of farmers, Mr. Stephenson reports, expressed satisfaction that the state was taking this step in stopping fires in this district, and one farmer said that he had planned to write to the State Department of Forestry and Geological Development and ask for a man to come out to his place and help him work out a fire control system.

From a Patrolman's Reports

Incidents reported by Patrolman Stephenson are as follows:

enson are as follows:

"I went over to inspect a smoke and found two negroes with a fire built close to the edge of a wood. They had shotguns and were looking intently into the woods. I asked them what they were doing, telling them I was with the state forest service and that my duty was to stop woods fires. They replied that they were hunting rabbits and they did not intend to let the fire get any larger. I asked them how they could run the rabbits out without letting the fire burn into the woods. They said a rabbit was afraid of fire and when he smelled the smoke, got some of it in his eyes and heard the fire crackling, he would start to running and didn't care where he ran. I, of course, put them to fighting fire and lectured them on such practices.

"Riding along one cold morning, I found two negroes on the roadside with a big fire going. I cautioned them against letting fire get into the woods nearby. I must have made it pretty strong, because when I returned fifteen minutes later they had stamped out the fire and were standing there shivering."

One school teacher told Patrolman Stephenson that her pupils slipped out into the woods and smoked and in this way had started several fires around the school. She suggested forest fire control education for them.

Mr. Stephenson states that the county agricultural agents are good co-operators and at least two meetings each year in their counties are devoted to fire control.

All fires but one investigated by Patrolman Stephenson had fighters on them. This was a small fire just starting, probably by a hunter. He suppressed it.

Prospective T. P. O.

Plans are under way for the organization of two timber protective organizations in District No. 3, one to be in Jasper county and the other in Green county. Mr. J. N. Walker, Monticello, and Mr. E. T. Boswell, Jr., Siloam, are instrumental in forming these timber protective organizations



Franklin County High School Students Plant Pines on Holbrook Farm Under Direction of Prof. Carl Parker, Vocational Teacher.

The annual meeting of the National Conference of State Parks will be held this year May 4-7 at Virginia Beach, near Norfolk, Virginia. The last day of the session calls for a trip to Yorktown, Williamsburg and Jamestown. Headquarters will be at the Cavalier Hotel at Virginia Beach.

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Landowners of Fourth District Cooperate Heartily With Forest Patrolmen

Patrolmen E. B. Doyle and T. L. Colwell both state that the landowners and farmers with whom they have come in contact have, almost without exception, offered wholehearted co-operation in outlawing woods burning.

Patrolman Colwell says: "I have had a number of people to tell me that they had never before seen so little fire on Pine Mountain. The whole mountain usually burns over once each year, but my neighbors have all joined in with me to stop every fire seen on the mountain this spring.

"I was riding along a byroad that made a circuitous route through miles of pine second growth in Harris and Muscogee counties. We frequently came upon the remains of 'warming fires' that the colored people of this section often build to warm by. I noticed that almost without exception the charred remains were in the road. In my contacts with the negroes, I always caution them to build their warming fires in the roads where there won't be any danger of starting fire in the woods. And I find that when our colored neighbors are once informed of the damage done by woods fires they try to be just as careful as 'white folks'."

Mr. Doyle was telling me of an interesting conversation he had on a Saturday afternoon at a crossroads country store. "I dropped in," he said, "and inquired of the storekeeper if I might place a forest fire poster on the front of his store. We walked out front and picked out a good place to tack it up. The usual store group gathered around and carefully read the forest fire poster. I introduced myself as a forest patrolman of the Georgia Division of Forestry. At this point, a new plug of 'Apple Sam Cured' was passed around, and then we got right down to business and discussed this bad habit of woods burning pro and con. Each man wanted two or three of those posters to put on his land to keep the 'other fellow' from starting fires. And there's where I took my cue and scored a point.

"You fellows are right as far as you go," I said, "but you haven't struck the key-

note to this forest fire proposition yet. Those posters may prevent a few fires from ever being set in the woods, but what good are those posters going to do when a fire gets started? The keynote to this fire protection is **co-operation** — co-operation first in preventing fires from ever getting started, and then 100 per cent co-operation from each man in helping his neighbors get those fires stopped just as quickly as possible after the first small smoke is seen.

"Don't wait until you think there's danger of that fire crossing your line to fight it," I said, "but grab a hoe or a pine top and go help that neighbor to put out the fire and then you will probably find your neighbors willing to come over and help fight your fires'."

FIFTH DISTRICT

H. M. Sebring, District Forester
Macon

Byromville High School and Macon County Training School Establish School Forests

Vocational Teacher B. O. Fry recently secured a 10-acre tract of forest land to be used by the Byromville High School in their forestry work. The plot was surveyed and a management plan is being made. The work was not inaugurated heretofore, because it was difficult to get a suitable plot close to the school.

The Macon County Training School (colored), of Montezuma, has also initiated the study of forestry. A suitable tract of 14½ acres has been secured from a colored farmer, W. M. Mathis, ten miles east of Montezuma. The plot affords excellent opportunity to teach the students, and the adults, of that particular section, the essentials of forestry.

Forest Patrolman Doing Effective Work

W. H. J. Carmack, farmer and sawmill man, is acting as temporary patrolman during the spring fire season in Pulaski, Crisp and Dooley counties. In a report of his activities, he states in part: "I am having what I think is splendid co-operation in forestry work. I have seen a large number of landowners and in nearly every case these men have tried to keep down fires. They are willing to co-operate with the state in every way possible to keep fire out. I have canvassed a good many tenants, white and colored, and find they are less concerned and quite a large amount of blame is laid to them for the fires."

S. A. Clements, farmer and former turpentine manager, is working as temporary patrolman in Telfair, Dodge and Laurens counties. Mr. Clements has protected his own timber from fire for a number of years and knows the value of fire protection. He has concentrated some of his efforts adjacent to the Ocmulgee Timber Protective

Organization in Telfair county and has gotten several additional landowners to sign up their land. He also reports that some landowners around Chauncey in Dodge county are plowing fire-breaks, and a lot more are interested in keeping down the fire in that section.

SIXTH DISTRICT

Jack Thurmond, District Forester
Savannah

Outstanding School Forestry Work

The type of work carried on by the Soperton Vocational High School boys on their school forest and home projects is of a high order. Last week they finished planting an old field to 5,000 one-year-old slash pine seedlings, which covers a little over seven acres. This planting was made according to the information published by the Georgia Forest Service in their latest bulletin entitled "Planting Longleaf and Slash Pine," all details outlined in this bulletin being closely followed.

A seed-bed 75 feet long and 4 feet wide was planted to longleaf and slash seed, which will give the school plenty of seedlings to plant in the field this coming fall and winter, and they will also have some to supply farmers who desire them.

Every boy taking vocational forestry work has a home project ranging from two to five acres in size. All of them have constructed firebreaks, planted seedlings and thinned a part of their home forest. Jim L. Gillis, Jr., has planted two acres in slash pine and has a seed-bed at home to raise his own planting stock. The vocational boys began work on a clubhouse in January and it will be completed in March. They plan to use it to hold meetings and organize a forestry club as soon as the cabin is completed.

In addition to the above activities, some phase of forestry is taught in every school in Treutlen county, both white and colored, and evening classes in forestry covering protection and planting work have been held by the vocational teacher to give the farmer an idea as to what they may expect from planting and protecting their timber.

Three Forest Patrolmen at Work

Three forest patrolmen started to work in this district during the last week in January, and will work until after the middle of April. These men who are loaned from the Savannah district office are as follows:

H. B. Stafford, with headquarters at Hinesville, patrolman for Liberty, Long and part of McIntosh and Bryan counties.

O. L. Williams, with headquarters at Egypt, works part of Chatham, Bulloch, Screven and all of Effingham county.

Jerry Walker, headquarters at Soperton, works Treutlen, Emanuel, Oconee and part of Toombs county. Mr. Walker was for-

merly employed by James Fowler of Soper-ton, and while with Mr. Fowler had charge of his planting and protection work.

These men were instructed for two days at a little meeting in Hinesville as to what was expected of them. In addition to the instructions they received, for one day they accompanied the district forester who played the part of a forest patrolman, allowing them to see just what was expected of them and how to go about it. They then proceeded to their respective territories, where they are always on the job contacting landowners, talking protection, fighting fire, co-operating with all T. P. O.'s and every landowner that wants to keep his woods rough.

New Members for Emanuel T. P. O.

Three new members were admitted to the Emanuel T. P. O., adding 5,000 acres which makes the area listed in this organization 16,255 acres. The men admitted were J. P. Snooks of Covenah, Ga.; Virgil Durden of Graymont, Ga.; and Ehrlich Brothers, of Swainsboro, Ga. All members of this T. P. O. have constructed fire-breaks, and instead of making the plowed and burned type, they are plowing solid breaks ten to twelve feet wide, which will average about \$4.00 per mile for construction costs. They are made with two-horse plows equipped with terrace wings.

Liberty T. P. O. Constructs Permanent Breaks

On February 16, 1932, the Burgman Tractor Equipment Company, of Jacksonville, moved their fire-break equipment from Wayne county to Liberty to begin plowing one hundred miles of fire-breaks on lands listed in the Liberty County T. P. O. The plans call for twenty miles of double breaks, which are made by running a complete round, letting the dirt lap over, which will make a completely plowed break eighteen feet wide. This will cut the big tract of 13,000 acres into four smaller tracts. Secondary breaks will be plowed in one operation nine feet wide with the Hester fire-break plow. Much interest has been aroused by the type of work this outfit does, and landowners from adjoining counties are continually coming to see the work, which is a good indication that maybe more mileage will be lined up for this outfit to plow while in this section.

FOREST RANGERS ON THE RADIO

Every Thursday at 1 o'clock, Eastern time, 2 o'clock Central time, the National Broadcasting Company co-operates in putting over 15 stations a radio drama relating to the work of the forest ranger. This is broadcast by the United States Forest Service. Time in and hour Jim Robbins and Jerry Quick on incidents of the forest ranger's life.

PROGRESS ON PAPER AND PULP LABORATORY

Operation May Start in April—Machinery Rapidly Installed—Heartiest Cooperation of All Agencies.

Experience has taught us all the dangers of predicting the exact date of finishing and entering a new house. For the same reason I dare not try to predict just when our research laboratory will begin making pulp and paper. My guess and hope is that it will be about April 1st.

All of the machinery, except the digester and the boiler, has arrived, and a good part of it has already been installed, but there is an enormous amount of detail work in connection with the fittings for water,

SOUTH MAKES STRIDES IN PAPER MANUFACTURE

The Manufacturer's Record, commenting on the strides the South is making in kraft paper manufacture, says:

"Rapid development has been made in the Southern pulp and paper industry during the past several years. 'The strange thing about this development,' writes Parker K. Baird of the United States Forest Service, 'is that it has been so long coming.' He shows that the South contains a vast reservoir of pulpwood and that conditions are favorable for maintaining this supply perpetually, for it is capable of producing stands of wood suitable for pulping purposes in approximately 25 years.

"The United States Government recognizes the South's advantages in paper-making.



Staff of Paper and Pulp Laboratory at Savannah. Left to right, W. T. Allen, Chemist; George C. McNaughton, Assistant Research Chemist; Dr. Charles H. Herty, Research Chemist; J. B. Osborn, Plant Assistant; Bruce Suttle, Plant Engineer.

steam and electric current. However, our very congenial staff is hustling, and before very long I hope to see a cherished dream come true.

When we are ready to go, we will be equipped with the full facilities for chipping and digesting wood for chemical pulp, for grinding wood for mechanical pulp, for treating or mixing these two in any proportions in the beaters and Jordan, and then for carrying it through an excellently constructed paper machine right on to finished paper.

A dozen cords each of slash, long-leaf and loblolly pines were cut at the beginning of the year, and have been lying on the ground seasoning since that time. This will be peeled and brought to the plant next week.

We are receiving the heartiest cooperation from everyone here in Savannah, and from all the officials of the department, all of which naturally makes happiness and good cheer.—Chas. H. Herty, Research Chemist.

ing, and it has been constructively working to bring about the fullest utilization of Southern forest products. Since the beginning of 1930, about one-third of the activities of the pulp and paper section of the Forest Products Laboratory have been devoted to problems related to the utilization of Southern wood. The principal pulp product of the South, at present, is the kraft type, best fitted for such products as brown wrapping paper, bag paper, container board, and similar products. However, Mr. Baird states that 'it can now be said that the South dominates the American kraft pulp industry.' He points out that so long as kraft pulp is the only paper product of the South, the situation will be economically dangerous; the South needs a diversified pulp industry."

Commenting on the above, the Augusta Chronicle says:

"The South is now recognized as the center of the kraft paper industry, but it has taken many years to start this natural development, one which should have begun 50 years ago. However, we are hopeful of

having a diversified wood pulp industry, as the paper-experimental plant in Savannah being conducted by Dr. Charles H. Herty and fostered by the State of Georgia, should make commendable progress along diversified lines.

"The slash pine, the gum, the poplar, the cypress and dozens of varieties of trees that grow in the South should all be given exhaustive tests as to the different kinds of paper that may be made from them, and there is no way of estimating the far-reaching results of Dr. Herty's experiments."

BLUE STAIN OF WOOD PRECAUTIONS NECESSARY

Anyone familiar with pine lumber especially, has seen blue stains which place the lumber in a low grade.

The cause of stains in fresh-cut pine timber are fungi that have entered the wood where beetles have burrowed. The fungi attack the sapwood, driving their mycelia toward the heart, which discolor the wood.

The beetle doing most injury to southern pines is the pine beetle (*Dendroctonus frontalis*). This insect attacks and, by the aid of the fungi introduced, sometimes kills comparatively thrifty trees. Other beetles of the genus *Ips* are likely to do their greatest damage to weak trees.

Timber owners generally realize that selling timber in the spring and summer increases, as a rule, the presence of tree beetles.

One can see gummy excretions or holes in pine bark, indicating that beetles are attacking the trees. The leaves of attacked trees take on an unhealthy color.

The best defense is to cut infested trees and utilize them at once, being sure to remove or burn all the limbs and tops of the trees that have been cut.

The Journal of Agricultural Research of November 15, 1931, printed a technical treatise on "Two Blue-Staining Fungi Associated with Bark-Beetle Infestation of Pines," separates of which have been made available as reprints. The article was prepared by Caroline T. Rumbold.

Recent Forestry Publication

"Planting Black Walnuts," Leaflet 84, United States Department of Agriculture, Washington, D. C., prepared by W. R. Matton and C. A. Reed, has recently been issued. Copies may be obtained on request from the United States Department of Agriculture. The circular gives a brief and practical discussion of when to plant, what to plant—nuts or seedlings, how to plant, and protection and pruning.

The National Lumber Association has announced that the work of the National Lumber Trade Extension will be continued, contracts sufficient to operate on a reduced basis having been signed.

NAVAL STORES RECORDS FOR SEASON 1930-'31

Georgia Produces More Than Half of Naval Stores Output of Country.

A special report by the Bureau of Chemistry and Soils of the United States Department of Agriculture covering the season 1930-'31, ending March 31, 1931, reveals that the naval stores industry has been severely influenced by the world-wide business depression.

From data available it was estimated 16,250 crops were worked. The industrial consumption of turpentine was less in 1930 than for any year since 1922, when comparable statistics were first gathered. The industrial consumption of rosin was less than for any year since 1924.

Georgia is far in the lead in naval stores production, Florida being the only state approaching this state. Statistics for the season 1930-'31 are as follows:

Turpentine (gallons)—Georgia, 15,465,216; Florida, 9,159,916; Alabama, 1,721,575; North and South Carolina (combined) 1,336,952; Louisiana and Texas (combined) 1,192,484; Mississippi, 1,062,323.

Rosin (barrels) — Georgia, 1,013,461; Florida, 621,032; Alabama, 115,027; North and South Carolina, 90,587; Louisiana and Texas, 80,202; Mississippi, 65,899.

Georgia and the Carolinas are the only states showing an increase in production as compared to the yields of the season of 1927-'28, and the Carolinas are the only states showing an increase over the season of 1929-'30.

The report of entire production from turpentine gum in the South is as follows: 1930-'31, 29,938,466 gallons; 1929-'30, 31,320,871 gallons; 1927-'28, 31,549,082 gallons.

For rosin, 1930-'31, 1,986,208 barrels; 1929-'30, 1,975,631 barrels; 1927-'28, 2,071,813 barrels.

Turpentine products distilled from wood for 1930-'31 (all methods), 4,255,225 gallons; 1929-'30, 4,619,253 gallons; 1927-'28, 4,333,176 gallons.

Rosin from wood distillation, 1930-'31, 438,917 barrels; 1929-'30, 478,555 barrels; 1927-'28, 452,187 barrels.

Industrial Uses of Naval Stores

The largest industrial consumption of turpentine is the paint and varnish manufacturers who took 4,089,743 gallons of the total industrial consumption of 5,045,224 gallons. Other industries in the order of their consumption of turpentine are: Shoe polish, 527,838 gallons; automobiles and wagons, 80,953; sealing wax, pitch, insulation and plastics, 70,236; chemicals and pharmaceuticals, 70,185; shipyards, car shops, 65,250; miscellaneous, 65,556; foundries and foundry supplies, 27,144; oils and greases, 21,776; soap, 10,539;

printing ink, 11,209; linoleum, 2,754; paper and paper size, 1,771.

Rosin is used in all the products mentioned for turpentine except that matches are added. The industry using the largest amount of rosin is paper manufacturers, followed closely by paint and varnish producers and soap makers.

Exports of turpentine (gallons) in 1930-'31 were 16,755,616; 1929-'30, 16,940,179; 1927-'28, 16,494,551. Exports of rosin (barrels) were: 1930-'31, 304,841; 1929-'30, 1,365,400; 1927-'28, 1,373,411.

ENGLISH POUND VALUE AND GEORGIA CLAYS

England is the chief competitor of Georgia in the matter of supplying the American market with clays. Georgia made steady progress in displacing English clays in this country until England discarded the gold standard and accepted silver as a monetary basis. This automatically lowered the price of English clays in the American market and Georgia producers found that competition had become severe in this gold-standard market. Hence, an appeal to Congress for an adjustment that would restore trade to a fairer competitive basis for American producers.

The value of the English pound, therefore, has a good deal to do with the employment of thousands of workers in the clay and shale deposits of Georgia and in Georgia industries using these raw products.

"Financial Aspects of Growing Southern Pine," prepared by E. A. Ziegler and A. R. Spillers, of the United States Forest Service, and C. H. Coulter of the Florida Forest Service, has been issued as Bulletin 7 of the Florida Forest Service, Tallahassee, Florida.

The bulletin reports the studies of a whole county in Florida and suggests what must be done to put forestry on a permanent paying basis in that region.

Dr. C. A. Schenck, former director of the Biltmore Forest School, has arranged to personally conduct a group of American foresters on a European tour, April 21 to June 8, for study of scientific forestry. The cost of the tour, from New York and return, is \$480.00.

The American Forestry Association will hold its annual meeting at Baltimore this year, in the latter part of May, the exact date to be announced later. The Maryland Forestry Association will hold its annual meeting at the same time.

Land Area for Food

It takes more than 2 acres of crops to produce food for an American, but it takes only 1 acre for a German, one-half an acre for a Chinese, and only one-fourth an acre of land to feed a Japanese, according to Dr. O. E. Baker, economist of the United States Department of Agriculture.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

MARBLES OF GEORGIA

Number 1

Georgia's marble output in 1930 reached in value nearly \$3,000,000. This output originated at quarries in the mountain section of North Georgia. Commercial marbles occur in a belt about 60 miles long, running southwest to northeast in Fannin, Pickens and Gilmer counties. In many instances, the marbles form the floor of narrow valleys, but in others they form bold bluffs 40 to 50 feet high on the sides of ridges. Usually marble formation occurs as one line of outcropping, but in a few places, notably in Pickens and Fannin counties, there are two outcroppings, one of which is inferior because of considerable impurities.

History—In 1840, Fritz T. Simmons began quarrying on a small scale at Longswamp valley, near Tate, in Pickens county. His sole product was tombstones, and quarrying and polishing was done by hand, but about two years later he erected a mill

below the quarry. This firm was succeeded by Rankin, Summy and Hurlick, two years later. In 1854, Summy and Hurlick erected a mill of four gangs of saws at the old quarries, two miles east of Jasper.

The civil war came. The Jasper quarries were taken over by Robinson, Richardson and Besinger, who operated them for two years. Then the quarries at this point remained idle until 1885, when James P. Harrison and others formed the Perseverance Marble Company.

The era of real development of Georgia marbles began with the construction of the Marietta and North Georgia railroad, now a branch of the Louisville & Nashville railroad. The first large development, after the construction of the railroad, was by a \$1,500,000 concern, the present Georgia Marble Company, formed in 1884.

Previous to this time, Georgia marble was practically unknown as building stone, but on account of the superior quality of the marble and the energy and businesslike methods of this and other companies, it has

gia Marble Company was opened in 1892 and was operated five years by the Atlanta Marble Company.

Physical Properties—Georgia marbles vary in texture from fine to coarse grained. The coarse grain varies from uniform white to dark, clouded and flesh-colored, and has great strength and low absorbive power.

There is probably no building stone in this country that has gained such widespread use in recent years and has given such universal satisfaction as Georgia marbles. The output of Georgia quarries is third or fourth among the states. Production has centered largely around Tate.

Prior to 1891, the use of Georgia marble was confined to interior finish and monuments. The first exterior use of importance was in constructing the Equitable Building of Atlanta. Now the stone is widely used for building purposes. The state capitols of Minnesota, Rhode Island and Porto Rico are made of Georgia marble. Among other notable buildings constructed of Georgia marble are the United States Government building at Boston, St. Luke's Hospital of New York, the Corcoran Art Gallery of Washington and the Field Museum of Natural History of Chicago.

At this time an effort is being made to have the new postoffice building of Atlanta erected of Georgia marble.

ROAD BUILDING STONE NOW IN ACTIVE DEMAND

Due to the enlarged program of highway building in Georgia, stone for road building is in greater demand than ever before. The annual value of the output of crushed stone is now about \$750,000, small and large operations considered.

Practically all of the stone used for foundations of paved roads in Georgia is derived from granite and limestone, both being high-class materials for this purpose.

The chief centers of production are granite deposits near Stone Mountain and Warrenton, North Georgia and limestone deposits near Perry, South Georgia.

Aside from the stone that enters into the construction of the body of the roadbed, lime and shale provide cement, and sand and gravel enter into the concrete mixture of the finished roadbed. All of these materials are produced in Georgia; in fact few states are better supplied with road-building material.

In addition to the materials used for the construction of paved roads and the bridges and culverts associated therewith, clay plays an important part in making sand clay roads of the coastal plain regions of the south.

In North Georgia, dirt roads which run mainly over soils with considerable clay are surfaced with "top soil," soil from woods or cultivated fields that contain enough organic matter to cause a degree of cementing.



Cherokee Quarry of Georgia Marble Works, Tate, Ga. This is a Typical Deposit of Georgia Marble.

and installed one gang of saws, near Marble Hill postoffice. A short time afterward, a mill was built by Simmons and Hurlick, two miles east of Jasper, which firm also did considerable quarrying near the present site of the Southern Marble Works.

In 1890 Tate, Atkinson and Company opened a quarry and erected two mills in Pickens county, near the present site of the Georgia Marble Works, one above and one

found its way into all parts of the United States.

In 1885, the Southern Quarries, located about four miles east of Tate, were opened by Miles and Horne to supply marble used in the staircases, wainscoting and floor of the new Georgia State Capitol building.

The Piedmont Marble Company was formed in 1886, the quarries of which are now owned by the Georgia Marble Company. The Amicalola quarry of the Geor-



FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



DROUTH'S EFFECT ON PINE GUM PRODUCTION

Federal Experts Issue Statement Indicating Critical Tree Condition After Long Drouth in Turpentine Belt—Light Working and Cessation Advised.

At a meeting of naval stores factors, held at Brunswick, an opinion was sought from federal naval stores research men, as to the effect of the severe drouth of 1931 on gum production of 1932 and for advice as to how trees should be handled to promote future yields.

A joint statement was issued by the following federal naval stores authorities: Dr. Justin Cary, Lenthal Wyman, and V. L. Roper, of the United States Forest Service, and F. C. Craighead, of the United States Bureau of Entomology. The statement follows:

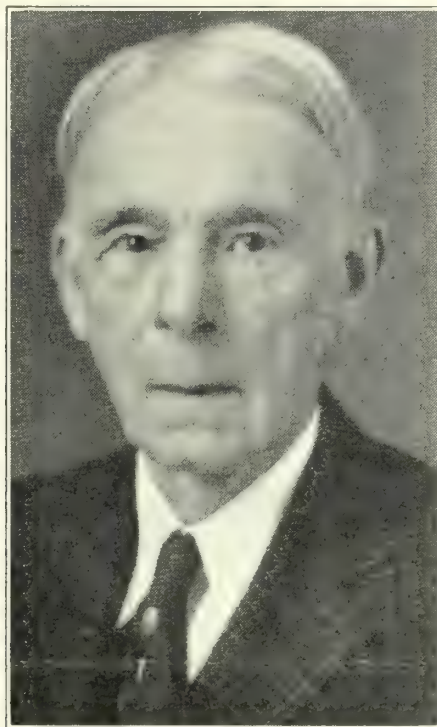
"It is well known that through much of the eastern section of the turpentine belt a very unusual drouth has prevailed since last spring. Effects have already been felt in the naval stores industry and the question has arisen among its leaders as to what may be expected should the drouth continue and what course is perhaps indicated for the industry to pursue.

"Weather bureau records rate 1931 as the driest year for many years, and the first two months of 1932 have been of much the same character. The ground, being dried out very deeply and thoroughly, enormous rains will be required to bring it to normal condition. Only a small yield of gum is to be expected while the soil is in this condition: Faces will dry in unusual numbers; timber may die in some quantity, the latter being helped by insects. We have recently observed all these phenomena. Unfamiliar to most, the part being aided by insects, as seen thus far, may be specifically mentioned. A small beetle boring through the bark, where the grubs girdle the trees, has been causing the destruction. It is an insect not to be feared too much, since it is normally in the woods and only attacks living trees when they are seriously weakened.

Of the causes contributing to the weakness of the timber and things that are important in themselves drouth is the primary

N. L. WILLET, FOREST PIONEER OF GEORGIA

N. L. Willet, Augusta, Ga., agriculturist, seedsman, writer and philosopher, was writing articles on forestry fifteen years ago in his daily contributions in the Augusta Chronicle, under the caption, "Daily Plant Hints," and is today syndicating articles that occa-



N. L. WILLET, AUGUSTA,
PIONEER IN PROMOTING FORESTRY

sionally treat of forestry. Mr. Willet developed Fulghum oats, promoted the use of vetches, Abruzzi rye, Biloxi soy beans, etc., and those familiar with his work credit him with contributing millions of dollars to the wealth of the South.

In 1920 and '21, when the farmer turned to the woods for succor, Mr. Willet in his effort to perpetuate the forests, urged farmers not to allow trees under 14 inches to be cut. He insisted that cutting smaller trees brought loss both to the sawmill operator and to the farmer. He spoke of cutting small stuff as a Herod-like effort against baby trees.

Mr. Willet has written often in his inimitable, common-sense and pungent style,

WOODS BURNING ILLEGAL EXCEPT JANUARY-FEBRUARY

Law Does Not Give One Legal Right to Burn Off His Own Woods Except for Two Months in the Year.

Burning off woods land is regarded as bad practice any time of the year. The lawmakers of 1910 and 1927 apparently thought that it was right to allow naval stores operators to practice what was termed "protective burning," which doubtless accounts for a two months' firing privilege each year.

In the South, the greatest number of forest fires occur in the spring, and after March 1, contrary to the provisions of the law.

The chief reason for fire outbreaks in March and April is the burning off of fields preparatory to land preparation for crops. Debris around the borders of fields is piled up and also burned. Fires thus started are not watched closely and soon get into the forests. At such times farmers think they are too busy to fight fires and let them alone to burn out. The fields from which fires spread to the forests, of course, are not fenced. If there were fences the farmer would feel that he must protect his fence from fire. Many of them value their fences more than their forests, at least they seem to think the loss of a fence is greater than the damage of fire to the forest.

Not only is the forest fire law being widely disregarded as to time for legal burning, but it is violated by a failure of a landowner to give the adjoining landowners a day's notice, as required by law, of his intention to fire his fields or woods.

The ideal way to deal with the forest fire problem is never to start forest fires purposely, and when, by accident, a fire is started, neighbors should cooperate to put them out quickly. Neighbors should also seek to prevent "bootleg" firing of the woods, that is, unlawful burning of the forests out of season.

burning for pasturage, he says, only perpetuates the unsatisfactory wire and sedge grasses.

It is with pleasure that Mr. Willet is listed among the Georgia pioneers in forestry and is given this small recognition for his val-

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DROUTH'S EFFECT ON PINE GUM PRODUCTION

(Continued from Page 1, Col. 1)

mary and by far the most important. To the best of our knowledge with early generous rains the other troubles should soon disappear. It should be noted further that some localities are more susceptible to the weakening influences than others. Pure sand, impenetrable clay or solid hardpan subsoil are such unfavorable conditions.

"Fire is another source of weakness to timber. Defoliated trees can only produce small amounts of gum and they are further weakened and their life endangered by working. Working for turpentine is itself a drain on the vitality of timber as evidenced in shrinkage of their rate of growth and the greater susceptibility of worked timber to other trouble.

"All these facts considered it is our opinion that the present time, lacking early and generous rains, may be a critical time for timber.

"We think the working of severely burned trees liable to lead to much loss.

"There are critical localities where it appears to us to be safer and advantageous not to work the timber at all until the drouth is definitely broken.

"We feel that if it is worked, timber should be carefully watched. Abnormally low yield is the first sign that men are liable to notice. A tendency to dry face and any sign of work by destructive beetle would be a still more forcible warning."

GENEROSITY AND COOPERATION MADE PULP PLANT POSSIBLE

Names of Those Who Have Contributed Time, Experience, Machinery and Good Will Are Given in Grateful Recognition.

In a recent issue of "Super-Calender," issued by the Pusey and Jones Incorporated, Wilmington, Del., an article entitled "Georgia's Research Pulp and Paper Plant," appears with illustrations. A complete history of the undertaking is given, with the facts of which the readers of the Review are familiar.

There also appears a description of the machinery and a list of manufacturing concerns that are donating and cooperating in the project. It is with pleasure that the names of these concerns are given in grateful recognition of the spirit of helpfulness manifested as well as for the material contributions that have made the research laboratory possible. While the splendid donations are a tribute to Dr. Charles H. Herty, who directs the research plant, they are also manifestations of interest in Georgia's contributions to research that merit the state's gratitude.

The following is an extract from the article:

"The layout of the plant was of utmost importance, not only to provide the latest and best type of equipment, but to parallel as closely as possible the technical and mechanical processes of commercial plants and, at the same time, keep the cost within the funds available. This was only made possible by the splendid cooperation of contributing manufacturers, the majority of whom supplied the equipment at cost or less.

"After considering offers from eight cities in the state, Savannah was finally selected and a warehouse building with adjoining dock and railroad siding, on the site of the Savannah Electric and Power Company, was made available by the Industrial Committee of Savannah through the cooperation of the Power Company, who are also supplying power and light, and otherwise rendering assistance.

"The Central of Georgia Railway co-operated by expediting the delivery of equipment, lending the assistance of their staff of construction engineers, and donating supplies for the foundation work.

"Acclaimed by all who have seen the plans as the most modern and complete plant of its kind, a brief mention of the machinery equipment at this time will, no doubt, be of interest. It is the intention to illustrate and describe this machinery more fully in a future issue of The Super-Calender.

"The semi-commercial section, planned to handle up to about two tons of paper per day of 24 hours, comprises: Circular saw for cutting pulpwood to length, 47-inch wood chipper, oscillating chip screen, sulphite digester of 60 cubic feet capacity made of acid-resisting stainless steel, digester circulating pump and acid system, three-pocket wood grinder with 42-inch diameter stone for 18-inch wood, water pressure pump and regulator for grinder, three-speed gear reduction for grinder, sil-

ver screen and chest for either ground wood or sulphite pulp, centrifugal pump for delivering pulp to pulp screen, six-plate pulp screen, pulp thickener or decker one sulphite and one ground wood storage chest, each 7 feet in diameter, 7 feet 6 inches high, complete with agitator equipment; post type plunger pump for delivering pulp to beaters, one 300-pound beater with bleaching and washing equipment, one 50-pound beater, post type plunger pump for delivering beaten stock to machine chests, two machine stock chests, each 7 feet in diameter, 7 feet 6 inches high, complete with agitator equipment; post type single plunger pump for delivering stock to Jordan, one motor-driven Jordan engine with regulating box, six-plate machine screen.

"The paper machine is of Pusey-Jones standard type to produce a sheet 26-inch maximum width, arranged with fourdrinier part having wire 31 inches wide by 33 feet long, press part with two sets of mair presses, dry part with 9-24-inch diameter drying cylinders, calender stack containing five rolls, two-drum upright reel, slitter and single shaft winder, driving arrangement with enclosed worm-gear drive unit for each section, connected by means of belts on cone pulleys to overhead lineshaft located parallel with the machine, machine speed 15 to 150 feet per minute through a Reeves change-speed device; a combination suction and white water pump with separator tank for the flat fourdrinier boxes and a centrifugal pump for handling the white water from the fourdrinier saveall.

"A number of the machinery units will be driven by direct-connected motors and the others belted from countershafting, in turn driven by motors. An oil-fired steam boiler of 30 h. p. capacity will supply necessary steam for digesting and drying.

"The laboratory section will be equipped complete with the latest instruments for making and testing pulp and paper on small scale, and compiling tests and record of semi-commercial operations.

Donors to Laboratory

First in importance is the Pusey and Jones Corporation, Wilmington, Del. whose engineers designed the plant and whose aid has been of greatest value to the undertaking. Others who contributed time, experience and good will in furthering the success of this project are the following:

Wood chipper and wood grinder, Cartage Machine Co., Carthage, N. Y.

Grinder roller bearings, S. J. K. F. Industries, New York City.

Grinder stone, Lombard & Co., Boston, Mass.

Grinder regulator, Meyer Governor Co., Minneapolis, Minn.

Grinder pressure pump and acid pump, Frederick Iron & Steel Co., Frederick, Md.

Grinder gear speed change, Philadelphia Gear Works, Philadelphia, Pa.

Pulp screen, beaters, Jordan, machine screen, laboratory equipment, Valley Iron Works Co., Appleton, Wis.

Digester, Blaw-Knox Co., Pittsburgh, Pa.

Blow-pit tile, Winslow Co., Inc., Portland, Me.

Pulp thickener, Improved Paper Machinery Corp., Nashua, N. H.

Acid-circulating system, Chemi Pulp Process Co., Watertown, N. Y.

Chrome steel valves and fittings, All Steel Products Co., Boston, Mass.

Stuff chest agitators, the Moore & Wright Co., Philadelphia, Pa.

Machine suction pump, Nash Engineering Co., South Norwalk, Conn.

Stock chests, G. Woolford Wood Treating Co., Philadelphia, Pa.

(Continued on Next Page)

Drive flexible couplings, Bartlett-Hayward Co., Baltimore, Md.
Machine deckle straps, U. S. Rubber Co., Passaic, N. J.
Couch jacket and press felt, Albany Felt Co., Albany, N. Y.
Fourdrinier wire, Cheney Bigelow Wire Works, Springfield, Mass.
Dryer felts, Fitchburg Duck Mills, Fitchburg, Mass.
Rubber-covered press rolls, American Wringer Co., Woonsocket, R. I.
Motors and electrical equipment, Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.
Belting and hose, B. F. Goodrich Co., Atlanta, Ga.
Chlorine and chemicals, Hooker Electrochemical Co., Niagara Falls, N. Y.
Lime products, Keystone Lime Works, Inc., Keystone, Ala.
Fuel oil, Gulf Refining Co., Savannah, Ga.

WHAT SPRING FIRES HAVE DONE TO GEORGIA FORESTS

Part of Public Ignorant of Damage—Informed People Must Spread the Message as an Economic Duty.

Forest fires have left their searing mark on millions of Georgia's forested acres this season. The blackened areas of fire invasion represent the loss of millions of dollars. Seedlings and young trees have been killed outright, all the years of growth they represented are wasted. Reforestation must start over again. Large trees have been checked in growth, some have been so weakened that they have become easy prey for insects and diseases. In every place where fire has visited the forest, the owner, the community and the state are poorer. In spite of educational effort to control forest fires, efforts that in one form or another have reached every community and a great part of the individuals of the state, forest fires still occur. Not so many fires, it is true, and more effort is being put forth to fight fire than ever before, but still fires that do widespread damage. This means that the whole public is not yet educated to the necessity of fire control. It means that those who do know what forest fires mean must carry the message to those who are ignorant. Public sentiment must be created as an economic measure. The development of many communities of Georgia will depend largely on how well the forest lands are protected.

What forest fires do and what they do not do are summarized briefly in the following statements:

1. Forest fires prevent nature from reforesting the land by burning seed and killing young trees.
2. Forest fires stunt growth and weaken larger trees so that they become more susceptible to damage by insects and diseases.
3. Fires destroy humus and nitrogen plant food and make the soil leachy, thus allowing needed moisture and plant food

to get out of the reach of tree roots.

4. Fires do not improve the pasturage of forest lands. Carpet grass which will furnish winter grazing is seriously retarded. Lespedeza, a wild legume of superior grazing value, is eradicated. Only tuft grasses, wire-grass and sedge-grass, that provide inferior short-season grazing, are left.
5. Forest fires do not kill boll weevils nor cattle ticks nor many other harmful insects that do not winter on the forest floor; they do not kill rattlesnakes, but they weaken trees so that tree insects do greater damage.
6. Forest fires do not kill palmetto, gallberry and wire-grass, but increase them because other competing growth is killed, giving these undesirable plants the right of way.
7. Fires do not prevent raked trees from dry facing. In actual practice, fires burn many turpentine faces where the forest litter is raked from around the trees, and dry faces are increased.
8. An unburned mulch on the forest floor checks erosion, reduces the surface run-off of rainfall and maintains a greater constant flow of springs, wells and streams, thereby conserving waterpower; but where the mulch with its rain-absorbing power is destroyed by fire, erosion and surface run-off are hastened and damaging floods result.
9. Forest fires destroy food and shelter of wild life; they actually burn many young, and destroy coverage so as to leave the survivors an easy prey to natural enemies. No better way can be found for driving out the quail than by burning off the forest.
10. Forest fires with their pall of smoke make highway travel unsafe; they blacken and make the landscape unsightly to travelers; they are a reflection on any community.

ASK FOR SOUTH GEORGIA TIMBER SURVEY

The Naval Stores section of the Savannah Board of Trade has passed resolutions asking the United States Forest Service to make a survey of the timber resources of South Georgia, in line with the provisions of the McSweeney-McNary Act of Congress. In the March issue of the Review, mention was made that Captain I. F. Eldredge, Fargo, Ga., had been appointed to have charge of the survey in the South. Captain Eldredge took up his duties March 15 and is now making his headquarters in New Orleans with the Southern Forest Experiment Station.

The cotton boll-weevil spends the winter under the bark of trees, in knotholes and crevices, and not on the ground, and is ignorant of the fact that some people believe they are destroying him when they burn off the forest floor.

MOUNTAIN TREE NURSERY LOCATED IN UNION COUNTY

Trees Adapted to Mountains and Upper Part of State to Be Propagated at Mountain Branch of Georgia Experiment Station.

After locating a site for a tree nursery at Albany for growing planting stock of trees native to south Georgia, the tree nursery committee of the Commission of the Department of Forestry and Geological Development selected a second state nursery site on the land of the Mountain Branch of the Georgia Experiment Station, located on the Appalachian Scenic Highway in Union county.

At this nursery certain species of trees native to the mountains, such as white pine, spruce, hemlock, black locust and pines will be grown. In an experimental way, Japanese chestnuts and northern species of other trees will be tried out.

An excellent site with a convenient water supply has been leased. Seeds are being planted and planting stock is expected to be ready for distribution by the end of the present growing season.

The two state nurseries, one at Albany and the other in the mountains, are expected to take care of the immediate demand, at least, for all trees required by the state for planting purposes.

Forest Fires From Broken Glass

Picnic parties and transients that leave broken bottles or broken glass in the woods develop a cause of forest fires. Curved pieces of glass intensify the rays of the sun shining on it to the point where fire will be generated in the dry leaves, beneath.

In southern France, investigations of forest fires of unknown origin revealed broken glass was found to be an important factor. Probably a number of Georgia fires have been started in the same way. A good rule to follow is never to leave broken glass in the woods, and when one finds glass in the woods, remove it to a place where there will be nothing combustible under it.

Virgin Timber Sold

One of the few remaining tracts of virgin pine in Georgia, known as the "Thomas Timber," near Camilla, is to be cut off, the timber having been sold to the Tyson Company, sawmill operators. It is estimated that the tract will yield 2,000,000 board feet of lumber. The timber is longleaf pine.

Practically the only virgin pine timber to remain in southwest Georgia is located on tracts of large estates owned principally by northern people as winter homes and game preserves.

FORESTRY QUESTION BOX

How far can a pine tree scatter its seed?

On the average, one-quarter to one-half of a mile, depending on the velocity of the wind in the fall when seed are released from the cones. Good stands cannot be obtained beyond 200 yards.

Is the slash pine better adapted to damp than dry land?

The opinion of foresters is now that slash pine has succeeded best in moist lands only because while young it is easily killed by fires and has had a better chance to escape fire in wetter areas. Planted on dry lands, it does well when protected from the fires; grows more rapidly than longleaf and produces more and better gum, according to conclusions reached by the United States Forest Service.

What species of pines are most widely distributed in Georgia?

Shortleaf and loblolly are the most widely distributed. Both are found throughout the state, but shortleaf exists in mountain regions that the loblolly has not invaded.

What is the "old field" pine?

Different species are called "old field" pine. Shortleaf and loblolly are species usually given this title. Grown in open fields, both form more limbs, develop wider crowns and have less height than when growing in the woods. It would be better to discard the term "old field."

What is kraft paper that is now made from pines?

Kraft paper is brown wrapping paper, or brown paper board. Pine is the chief source of fiber used and great progress has been made in the South in manufacturing these products. The long, strong fiber of pine makes a tough, strong paper and board.

The wood pulp laboratory established by the Department of Forestry and Geological Development of Georgia, the Chemical Institute Incorporated of New York, the City of Savannah and others, at Savannah, is designed to work out the commercial problems of using pines for making white paper, an end already achieved on a laboratory scale.

To what uses are blight-killed chestnuts put?

The invasion of chestnut blight has resulted in the death of a great part of the chestnut trees of the mountains and is expected eventually to exterminate the species. On account of the abundance of chestnut in the mountains, the dead trees are of commercial importance. They are being removed for poles, cross-ties, fencing, lumber, pulpwood and tannic acid. Manufacturers distill the tannic acid from the wood and utilize the fiber for making paper boxes.

Can the blight-resistant Japanese chestnut be used to replace the American chestnut?

It will probably never be practical to plant Japanese chestnuts in the mountains to replace the native chestnut. All seed must come from the Orient and several years will be required to produce a supply of seed in this country. The most that can be expected is that the Japanese chestnut may find a place in the farm woodlot of this country.

What is meant by "second-growth" trees?

The term is intended to refer to growth following the removal of the original or virgin growth. It is evidently being applied loosely to third-growth or new growth in general. "New growth" is probably better than "second-growth" in many instances and the time will come when "second-growth" should have no place in forestry parlance.

FORESTRY ASSOCIATION PROGRAM IN PREPARATION

A meeting of the program committee of the Georgia Forestry Association was held at Rome on March 10, at which time a tentative program was arranged. The place of meeting will be at the General Forrest Hotel at Rome and the time, June 22 and 23.

A program was outlined covering a wide range of subjects touching utilization of forest resources, land utilization, reforestation, mineral development, education and recreation. A number of prominent speakers for the program are being sought.

Exhibits are to be featured in which utilization, forestry activities, mineral resources and recreation will have a part.

Bonnell Stone, secretary of the Association, Oxford, is chairman of the program committee. Others attending the program committee meeting were President T. G. Woolford, C. B. Harman, chairman of the Executive Committee, of Atlanta; J. M. Mallory, Savannah; Wyatt Foster, Secretary of the Chamber of Commerce, Rome; and W. D. Young, District Forester, Rome.

GROWING CIGAR BOX TIMBER IN PORTO RICO

More than 40,000 Spanish cedar trees, known also as cedro, were distributed for planting last fall by the Forest Service of the United States Department of Agriculture from its principal nursery in Porto Rico to coffee planters of the island.

The Spanish cedar is one of the most highly esteemed lumber trees of the West Indies. Its most important commercial use is for the manufacture of cigar boxes. Planted as a protection on the coffee trails, it grows rapidly but not so large as to completely shade out the coffee plants.

Enemy Insects of Trees

It has been found that 400 insects attack oaks, 170 attack hickories, 100 attack maples, 105 attack birches, 186 attack willows, 165 attack pines, 40 attack locust. Birds are the chief enemies of insects.

DROUTH INCREASED FIRE LOSS, HEAVY DAMAGE, 1931

State as Whole Suffered 32 Per Cent Burning of Forest Area—Protected Land Only .02 Per Cent—Land- owners Fight Fires.

The drouth of 1931 increased the annual fire losses of Georgia, according to statistics compiled by the Division of Forestry. Nearly a third of the forested area, or 32 per cent of the state, was burned over in 1931, compared to 20 per cent for 1930. The area burned over in 1931 amounted to 6,281,012 acres; in 1930, 4,605,193 acres.

The records of the State Forester show that South Georgia sustained the highest loss, as usual, due to the greater fire hazard of that section, a hazard that was increased greatly by the drouth last year.

The financial loss caused by the fires is estimated at \$6,923,119 in 1931. This is the heaviest damage for Georgia for which there is any record.

While this heavy loss was sustained for the state as a whole, on lands under organized protection and belonging to the timber protective organizations, the loss was .02 per cent, evidencing how well the forests can be protected if proper measures are taken. The protected area is 1,909,000 acres. The number of fires on protected areas was 506 and for the state as a whole, 22,690.

According to the State Forester the percentage of burned land would be much less if turpentine operators did not burn over their land after raking around the trees, and if such fires were kept from spreading beyond the turpentine operators' property or leases.

The State Forester says that the Division of Forestry was able to make a fuller survey of the state in 1931 than previously which he considers may account for some of the increase in total area burned as compared to previous years. He also states that the area burned during the drouth last fall would undoubtedly have been much greater than it was had landowners not cooperated with the forestry force in fighting the numerous outbreaks. A growing disposition of property owners to fight fires, it is stated, was an encouraging feature of the year.

Tool for Poisoning Trees

A machine weighing about 16 pounds holding three quarts of liquid poison originally designed by Joshua A. Cope and J. Nelson Spaeth of Cornell University, and improved by A. L. MacKinney of the United States Forest Service, has been used successfully in Georgia. It can be operated by one man, and three quarts of poison will treat approximately 125 trees. About a teaspoonful of poison is inserted with each incision. This instrument is useful for killing undesirable trees in the forest stand.

FIRST DISTRICT

W. D. Young, District Forester
Rome

Fire Control Measures Effective

C. S. Fowler, patrolman in a section around LaFayette, reports that he is having good cooperation in fire suppression and that most of the landowners do not want their forest land burned over. Several fires have occurred, but most of them were of small size and were readily suppressed. He reports that on several occasions landowners were already on the fire lines when he reached them. On the largest fire so far, twenty men were fighting at one time and stayed until the fire was out, which was 2 o'clock in the morning.

Mr. Fowler finds that water pumps are successful in combating fires, if there are two or more men on the fire line, and if water can be found not over an eighth of a mile away. In mountain country water can be found within this distance, unless a dry season occurs.

Bauer Located at Jasper

Mr. E. Bauer was appointed the first of March to take the place of W. A. Johnson.

Mr. Bauer's headquarters are at Jasper and he will patrol the same section Mr. Johnson patrolled, which includes Pickens county and parts of Gilmer, Gordon and Murray counties.

Vocational Schools

All vocational schools have been visited in District One, with the exception of two, and these will be visited some time in March. Several of the students are working hard in an effort to win a scholarship or attending summer camp.

Berry Schools Plant Pines

The Berry Schools will plant 4,000 loblolly pine this spring. On account of poor germination of seed last spring the number to plant will fall far short of the number expected.

Seed will be planted this spring with hopes of having some 15,000 seedlings to plant next spring.

Notes on Forest Fires

Forest fires were sufficiently numerous during the dry days in March to keep the fire patrolmen rather busy. One of the things brought out by the investigations made by the patrolmen is that a large number of the smokes which appear to be forest fires from a distance are caused by brush burning or the burning off of sage fields, which, in most cases, are not communicated to the forest.

The brush-burning activity is very widespread at this time and, of course, is one of the main causes of forest fires. The patrolmen have investigated a large number

of brush-burning activities, and by cautioning the owner, it is believed that many fires were prevented.

For one short period during the month, the fire hazard was very high, owing to the extreme dryness and high winds, and one of the patrolmen reported that it was so dry in his district that he considered it dangerous to have a fire in the fireplace.

SECOND DISTRICT

E. B. Stone, Jr., District Forester
Gainesville

Yellow Poplar Brings High Return

The forests of North Georgia are made up of some of the most valuable trees to be found anywhere in the United States. This fact was very strongly brought out in a recent sale of poplar made by the Pfister and Vogel Land Company from their holdings in Towns county. This sale included several trees, all of which contained curly lumber, which is very highly prized for furniture manufacture.

One of these trees was 69 inches in diameter at 4½ feet from the ground and scaled 10,149 board feet, being one of the largest, if not the largest, tree ever cut in Georgia. The price per thousand on the stump was \$30.00, giving this tree a value in the woods on the stump of more than \$300.00.

Yellow poplar forms a considerable percentage of the trees forming the forests throughout the mountainous part of the state, and with the increased efficiency in fire protection it will occupy a still greater portion of the stand in the future.

Many of the old fields in the country to the north of the Blue Ridge have restocked with poplar, and some of these stands will produce a very large amount of timber per acre and have a very high money value.

Poplar reaches its best development in this region, and we are fortunate in having such a valuable tree as one of our principal timber producers.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

Dry weather has kept Patrolman Stephenson busy during the last few weeks. Many farmers are "clearing up" bottoms and other lands, and he finds it quite a job to investigate every smoke. On one occasion he tells of investigating a smoke and after riding a mile down a secondary road to a farm house, found the smoke across the river. It was necessary to use the farmer's boat to cross the river and put out the fire, which evidently started from fishermen.

T. P. O. in Greene County

Plans are under way for the organization of a new T.P.O. in Greene county. E. T.

Boswell, Jr., of Siloam, is instrumental in "rounding up" the landowners and interesting them in placing their land under systemized fire control.

Students Plant Trees

T. E. Fleming, Vocational Teacher of Bio Consolidated School, planted 1,000 loblolly pine seedlings on the land of Mrs. Bobo, who lives in Bio community. This project was under the supervision of Mr. Westbrook, County Agent of Hart county. The seedlings were secured from the Forest School at the College of Agriculture.

Office Secured in Augusta

The District Forester wishes to extend thanks through this column for the cooperation of W. A. Lufburrow, editor of the Augusta Herald, and J. Marvin Wolf, of Augusta, in securing a well lighted private office on the third floor of the court house.

Got It From the Review

From a letter of March 15, 1932, from Mr. William H. Carr, Assistant Curator of American Museum of Natural History, New York City: "I always enjoy receiving the Forestry and Geology bulletins and am always interested to read what is going on in your section. The last issue was particularly informative; I learned that St. Luke's Hospital, here in New York, was built of stone from Georgia, and when I passed it in a cab with a friend the other night, I could point to it and say, 'I know where the stone came from that you used in this building'."

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Butler High School to Study Uses of Sand Ridges

Students studying vocational agriculture at Butler High School have accepted the responsibility of doing pioneer research work in forestry in Taylor county. There are extensive areas of sandy-ridge type country in Taylor county that at present are proving to be a liability to the county. This particular type of soil is well adapted to the growing of the dual-purpose longleaf pine tree, but is largely covered with a mixed growth of practically worthless scrub oak.

The object of this research as carried on by Mr. W. M. Cowart and his pupils is to ascertain whether or not it is necessary to clear the scrub oak in planting longleaf pine.

Considerable progress in forest fire prevention has been made in Taylor county through the concerted efforts of the Taylor-Talbot Timber Protective Organization now cooperating with the Division of Forestry, and the Taylor County Forestry

Committee of which Mr. J. S. Green is chairman. This forward step of fire prevention is a most important movement. A movement equal in importance is the reforestation of the large areas incapable of natural reforestation. Mr. Cowart and his pupils have undertaken to secure data under existing conditions that will show the most practical and economical way of reforesting these large areas incapable of naturally reverting to longleaf pine.

Reforestation of Newnan Town Forest

The city of Newnan, Ga., recently planted a total of 27,200 seedlings, reforesting a total of forty-eight acres at an average of \$3.62 per acre. This planting consisted of 22,000 longleaf pines, 2,200 black locust, and 2,000 black walnut seedlings. The pines were spaced in rows 7 x 8 feet; the walnuts were planted in rows 20 x 20 feet.

An interesting phase of this year's planting is the substitution of a black locust seedling for every fifth longleaf pine planted. The primary object of this experiment is to obtain a crop of black locust posts before the slow-growing longleaf pine attains any appreciable size.

SIXTH DISTRICT

**Jack Thurmond, District Forester
Savannah**

Fire Break Maintenance Cost Low

Mr. J. B. O'Connor, President of Oconee T. P. O., started plowing solid fire breaks in 1930 which were 10 feet wide. This cost on an average per mile was \$6.00, including the wages of two men who cleaned out fallen logs and other obstacles while the plowing was being done. Breaks of this type were constructed by using two-horse turning plows equipped with terrace-wings.

In 1931 these breaks were used intact with the exception of adding two furrows on each side to make them a little wider and to cover up the small amount of litter which had accumulated in each outside furrow. This year these firebreaks were freshened by making one round on each break with a disc-harrow pulled by two mules at a cost of \$1.50 per mile, which is very cheap maintenance cost on land in Southeast Georgia where permanent plowed breaks are used.

Ehrlich Bros. Plant Slash Pine

The Ehrlich brothers, new members of the Emanuel T. P. O., planted 8,000 slash pine seedlings on wornout farm land. The plantation has been put under fence and is to be used as pasture land as well as for timber growing. The plantings were completed the last week in February. Two thousand seedlings from the State Nursery were mixed along with 6,000 wild or woods grown stock one to two years old. The most approved method of planting slash seedlings

was used, which consists of a furrow plowed with a 4-inch "scooter plow" and two furrows thrown to this with a turning plow. The advantages of this method of planting are a water furrow to help conserve the moisture during dry periods, furrows that will give some protection from fire and allow the small trees to get started before other faster-growing vegetation can choke them out. To date, 95 per cent have survived.

Effect of Drouth on Young Timber

W. I. Stafford, patrolman for Liberty county T. P. O., writes: "Liberty and adjoining counties have lost severely from woods fires during the past fall, winter and this spring. The loss to the inheritance of boys and girls of Liberty county is from a quarter to a half million dollars in the destruction of young pine and cypress timber alone, besides the damage to older trees that are now being worked for turpentine. The weather has been very dry throughout the season, and the ponds, branches and bays have burned also. The drouth and high winds have been the chief reasons why fires were so difficult to suppress, and why they spread over such wide areas.

"If one will observe the 'fat' stumps now standing in the woods and picture these as trees, he may see in his mind's eye how this country looked 50 years ago. Now one can see plenty of areas from 10 to 20 acres in size with not a green tree standing. Tracts of land that were denuded like this 20 years ago and have been burned over every year or two, have not been able to start a new growth. However, every year or so one may observe a good stand of longleaf and slash peeping their heads up through the wiregrass, only to be burned over and killed again. How much longer can, or will, the landowners stand for this sort of practice and continue to pay taxes on land that only produces wiregrass, gallberries and palmettos?

"Visitors from the northern part of our country, and also foreigners, are struck with the value and beauty of our southern pine forests and are amazed that we are so careless with fire. Many of these people know that fires should never burn through our pine forests, while we who live here and get most of our living from timber and its products look upon woods-burning in the spring as a matter of course and pay little attention to it.

"All landowners should join timber protective organizations, plow firebreaks, purchase fire-fighting equipment and get together and say, and mean it, too, that this woods-burning must stop, and stop it through cooperation. It is our patriotic duty, and is much less expensive."

No one feels like writing an ode to spring when the tang of burning forest is in one's nostrils and the atmosphere is dense with smoke.

SEVENTH DISTRICT

**C. Bernard Beale, District Forester
Savannah**

Fourth Forest Patrolman Assigned

T. E. Herndon, experienced firefighter and towerman, formerly employed on Suwannee Forest, was assigned the fourth patrol area in this district. Mr. Herndon makes his headquarters at Statenville and is covering western Echols, southern and eastern Lowndes, southern Lanier and eastern Clinch counties.

"Crow's Nest" Lookout Erected on Suwannee

Mounted on a pine pole, 80 feet in the air, a small platform "crow's nest" lookout has been erected at Fargo by Capt. I. F. Eldredge, forest manager.

The pole is about 14 inches at the base and is anchored between two squared 14-inch by 14-inch supporting timbers. Four steel guys make the contraption rigid. The pole is climbed by means of steel spikes driven in the pole. A home-made range-finder is mounted atop and gives satisfactorily accurate readings on fires.

The lookout supplements three steel towers on Suwannee Forest and is proving of great value in helping to locate fires in territory "dead" to the other towers.

Hats Off to South Georgia Fire Fighters

Few people realize the terrific fight put up by timberland owners, and the vast force of turpentine workers, towermen, patrolmen and farmers during the past six months in south Georgia. In many instances, due to the absence of any water in the woods, it has often been necessary to "fight it out" with the fire right on the fire line.

Working under terrible heat and smoke, long, long, weary hours, day and night south Georgia firefighting crews have met these crucial tests with resolute courage and commendable loyalty. Even in thickest roughs, fires, whipped into fiendish fury by high winds, have been "manhandled" with the aid of knapsack pumps and pine tops. It has been mostly a case of "get in there and beat it out," dead on the line, with no chance to backfire.

After the fires were temporarily checked, there followed the weary, painstaking work of "mopping up." Infinite care had to be exercised to see that every snag was felled near the line, every down log across the line chopped, and every tiny wisp of smoke "outened," often over many miles of fire line.

The woods have been like a powder magazine for the past six months, and men have had to work like demons on fires or only a few square feet to prevent them from instantly becoming unmanageable.

While large areas have been burned, th

losses great, and the situation at times almost hopelessly disheartening, yet it is due to the great valor of these men in the woods, toiling day and night, that many thousands of acres of turpentine lands have been kept free from fire.

To them, the commonwealth should be forever grateful, and to them we should say with one accord, "Hats off!"

Sparks-Adel to Show Forestry Films

C. R. Hazen, vocational teacher at Sparks-Adel High School, advises that a portable motion picture projector has been obtained for showing educational films. The project is sponsored by the Sparks-Adel chapter of the Future Farmers of America.

Mr. Hazen states that films on different phases of agriculture and forestry will be shown from time to time in the county schools. It is Mr. Hazen's plan to emphasize fire protection, particularly in connection with the school's forestry project.

Film Shown in Camden County

Through the courtesy of Dupre Barrett, extension forester, three motion picture shows were given recently at Woodbine and Kingsland. The shows were sponsored by the Camden County Timber Protective Organization and were arranged by Karl Meschke, forester for the Georgia Forest Products Company.

The pictures shown were "Friend of Man" and "How Forests Serve." Many people from all over the southern part of the county saw the pictures. Plans are being completed for giving two more shows at Waverly and White Oak the latter part of March.

EIGHTH DISTRICT H. D. Story, District Forester Albany

Patrolmen Finish Work

The three special patrolmen for the Eighth District, Grady Welch of Decatur county, George Sutton of Tift county and V. A. Shepherd of Randolph county, are striving in the last two weeks of their work to reach every landowner that has not been reached and to interest him either in fire protection or suppression.

These men have overlooked no opportunity to work with the timberland owner, and, in many instances, report very gratifying results. The colored landowner and tenants have come in for their share of attention and have been contacted individually on the farm and collectively at their churches, where the patrolmen have gone to carry lessons of protection and conservation.

All patrolmen report bush burning around cultivated fields as the source of many of the fires and are trying to instill into the



JOHN CROSBY, BOY TIMBER FARMER,
SALE CITY, GROWS PINES FOR FUTURE

mind of the farmer the value of farm woodlot protection.

Student Home Projects

Much interest is being taken in home project work among the vocational school boys of the Eighth District, and in many cases the boys have prevailed on their fathers to put in firebreaks to protect their timberland.

One boy timber farmer, John Crosby, Sale City, has established firebreaks around his five-acre tract, is making improvement cuttings under the direction of the Division of Forestry and is keeping accurate figures on his cost of management and the income from his tract.

A seed-bed was established, but it was found that as a result of fire protection, one seedling for every two square feet had come in naturally on this five-acre tract, which will necessitate a thinning.

The seedlings grown in the seed-bed will be used in planting about sixty acres of protected land of this boy's father.

Everglade National Park

Through persistent and well-directed effort of Floridians, the Everglade National Park, located on the southern tip of Florida, has been authorized. In many respects this new park differs from any hitherto established. It will preserve subtropic vegetation and wild life, and open to visitors a region of unique and entrancing scenic wonders.

Roofers Elect Officers

The Roofer Manufacturer's Club, at its annual meeting, held at Columbus, Ga., elected the following officers for the year 1932: J. G. Reynolds, Brantley, Ala., President, and W. R. Melton, Cuthbert, Ga., Secretary. B. T. Slade and C. L. Lunsford were elected Vice-presidents for Alabama, and Hugh Thurston and Gerald Saunders Vice-presidents for Georgia.

A fire in hand is better than one in the brush. Put out the burning match!

OVERESTIMATING AREA OF FIRE DAMAGE

The tendency of most people is to overestimate rather than underestimate the area burned over by fire. An area one mile square, especially in rough country, appears to be much larger than it is. When the area is stretched out in a strip the deception is likely to be even greater. If the burned strip averages only half a mile wide, it must be two miles long to be a square mile, or 640 acres.

Irregularly burned areas are likely to be measured by their greatest width rather than by their average width.

Careful estimates are likely to reduce the size of the casual estimate and the record for fire damage will usually be less as a result rather than greater.

Southern Forest Tax Laws

"Only four southern states—Virginia, Alabama, Mississippi and Louisiana—have forest tax laws of any kind. The Virginia law, which was passed in 1930, provides for a deferred tax on forest tracts. Up to July 1, 1931, however, no lands in the state came under the operation of this law. The Alabama, Mississippi and Louisiana laws provide for exemption of forest trees from taxation and a yield tax on timber when cut. On July 1, 1931, in Louisiana, 2.1 per cent of privately owned forest land had been taxed under the special law, while in Alabama only two-tenths of 1 per cent, and in Mississippi none of the land was so taxed." — Carl Williams, member Federal Farm Board.

How Does Wood Compare in Fuel Value With Coal?

Generally speaking, two pounds of dry wood equal one pound of coal. One cord of heavier woods, such as maple, hickory and cherry, is equal in heat value to one ton of coal. Lighter woods, such as cottonwood, yellow poplar and basswood, have heat values in two cords equal to that in one ton of coal.

Pines carrying considerable rosin have relatively higher heat values, being considerably above hickory but varying with the rosin content.

Growth of Old Planting of Shortleaf Pine Measured

On the Windsor-Spring property, near Augusta, Ga., plantings of shortleaf pine were made about 66 years ago. Recently measurements were made by Eitel Bauer and Charles Nuite, foresters. Their records show that the trees averaged 73 feet in height and 14½ inches in diameter at 4½ feet from the ground.

The shortleaf is one of the slower growing pines and, according to these measurements, increased their diameter a little less than a quarter of an inch a year on this site.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

GRANITES OF GEORGIA

Article No. 2.

Granite constitutes one of the great natural resources of Georgia. Its development has grown steadily until the income has reached annually about \$2,000,000. The supply is inexhaustible and the quality of much of it is of high grade.

History: Records show that some granite was quarried at Stone Mountain as early as

granite, a material that takes a high polish and is in great demand for monuments and building materials.

Another distinct belt of commercial granite lies south of that just mentioned and extends from Madison and Eatonton northeastward through Greensboro to Washington in Wilkes county. Comparatively few quarries have been opened on this deposit.

Still another belt lies further south along



GRANITE QUARRY ON SLOPE OF STONE MOUNTAIN

1845. The first systematic quarrying there, however, was begun in 1869, when the Stone Mountain Granite and Railway Company was formed by John T. Glenn, S. M. Inman and J. A. Alexander of Atlanta, and quarries were opened on the side of Stone Mountain.

In 1882, Venable Brothers of Atlanta, purchased the holdings of the above-mentioned company and began operations on a much more extensive scale. Annual shipments grew rapidly, attaining to 20,000 carloads a year. Under the leadership of Venable Brothers, Georgia took high rank among the granite-producing states. At one time this state even surpassed Vermont, known as the "Granite State," in its output of granite.

Production grew rapidly in the Stone Mountain vicinity and spread to Lithonia, Conyers, Snellville and Lawrenceville. As many as 52 quarries have operated in DeKalb, Rockdale, Gwinnett, Newton and Walton counties. The greatest production, however, of this area has been between Stone Mountain and Conyers.

In 1891, granite development began in Elbert county, with the opening of Coggins quarry near Ogleby. Other developments occurred near Elberton, also at Lexington in Oglethorpe, and at Athens in Clarke. This region became famous for its blue

the fall line between the Coastal Plain and Piedmont Plateau, extending from Milledgeville through Sparta, Warrenton, Thomson and Appling to a point near Augusta. Considerable commercial development has been made of this deposit.

The greatest area in the state in which commercial development has occurred spreads from Lawrenceville and Covington, on the east, through Conyers, Lithonia and Stone Mountain, south of Atlanta, to Fairburn, Newnan, Franklin, LaGrange, curving from its western extremity eastward to Greenville, Zebulon and Griffin. Quarries have been operated not only in the Stone Mountain territory mentioned but in Campbell, Coweta, Heard, Troup, Meriwether, Pike and Spalding counties.

While these belts mentioned are the chief sources of commercial stone, granite and granite gneiss compose the foundation of much of the Piedmont Plateau of Georgia.

Uses: Georgia granites have been used for buildings, street paving and curbing, monuments, as materials for concrete aggregate, and ballast for railroads.

Because of the closeness of its grains, hardness, strength and structure, granite is unsurpassed for construction purposes. The color and texture of many Georgia granites is unexcelled, if equaled. A visit to the Museum at the State Capitol will reveal

blocks of a great variety of very beautiful Georgia granites, many of which take a high polish.

Perhaps the most observed and noted granite structure in Atlanta is the monument to Henry W. Grady on Marietta street, made from granite from the Constitution quarry, south of Atlanta. Another is the Georgia monument to a Confederate soldier in Chickamauga Park, made of granite from Lexington quarries.

Many of the buildings of Atlanta have granite for foundations and for trimmings. Several are made entirely of granite, among them churches. Since DeKalb county is the greatest producer of granite, it is, of course, natural that the DeKalb county courthouse should be made of granite.

Many southern cities have used Georgia granite, and even in the north, where granite is quarried extensively, Georgia granite has found a place, such as the coping for Riverside Drive in New York City, and walls for Weidner's sunken gardens in Philadelphia.

Granite of Baldwin county, used in the old state capitol at Milledgeville over one hundred years ago, shows no sign of deterioration.

The most widely known display of granite is Stone Mountain, a great domelike elevation, with a sheer escarpment of over 600 feet on its eastern frontage, on which the greatest carving ever undertaken is projected—the monument to Confederate soldiers in Georgia's everlasting granite.

The uses of granite are varied. Before concrete came into general use for streets, Belgium blocks or cobblestones flowed in steady carloads in the 80s and 90s from Georgia quarries. Curbing material was also in great demand. Now granite blocks for paving have given way to crushed granite for concrete streets and roadways. No better material for this purpose can be found anywhere. Georgia granite for this purpose is, however, not as broadly distributed as it was for street paving.

To the extent that granite is demanded in the future, Georgia is in position to compete with any other state in the Union.

DOLOMITIC LIMESTONE

IN COTTON FERTILIZERS

Experiments conducted by the Georgia Experiment Station show that the use of dolomitic limestone in cotton fertilizers containing sulphate of ammonia, is a profitable investment in the Piedmont section of the state.

From 100 to 200 pounds increase per acre of seed cotton is reported by putting as much dolomitic limestone in the fertilizer as there is sulphate of ammonia. This treatment of fertilizers is comparatively inexpensive.

Knox dolomite is a limestone carrying about 16 per cent magnesia (mgo). Surface outcroppings are found in the northwestern part of the state.

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DEPARTMENT OF FORESTRY AND
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No. 5

FAMOUS GEORGIA TREES

Wesley and Lanier Oaks, Trees That Own Themselves, Largest Trees in State Among Noted Ones.

Brunswick has the distinction of having two of the most famous trees of Georgia, the Wesley Oak and the Lanier Oak. John Wesley is reputed to have delivered his first sermon as a missionary to America under a liveoak on St. Simons Island near Brunswick. The ancient oak, hoary with grey moss, is pointed out to thousands of visitors each year.

The Lanier Oak is near Brunswick on the edge of a marsh. It is under this oak that the Georgia Poet, Sidney Lanier, wrote his famous poem, "Marshes of Glynn."

The first tree in the world to own itself a large white oak located at Athens. This tree has the unique distinction of having a tract of land around it deeded to itself. The people of Athens see to it that its tree's rights are respected.

The second tree in Georgia given ownership to the land it occupies is the Oxford Oak at Oxford, Georgia. It is a magnificent white oak and the people of Oxford are giving it the right to complete its life unmolested.

Thomasville boasts of the largest liveoak in the State. It is a mammoth tree with a short trunk and great outstretching branches. These branches are as large as the trunks of mature trees.

An oak that has gained wide publicity is the Lincoln Oak near Albany. Its fame flows out of the fact that the tree has grown into the shape of Lincoln's head. The road from Albany to Radium Springs a silhouette of the tree reveals the Lincoln features.

A number of trees have been planted on State Capitol grounds in honor of notable men of Georgia, mainly governors. In parks of a number of cities and towns of the State, trees have also been planted in honor of leaders.

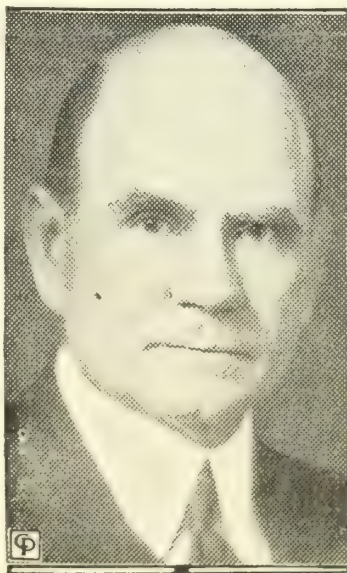
Perhaps there are other trees that deserve to be listed among Georgia's famous trees. If so, the Review will be glad to give mention of them.

SENATOR W. J. HARRIS FRIEND OF FORESTRY

In the death of Senator William J. Harris of Georgia, the cause of forestry lost a strong advocate. As a member of the committee on the acquisition of forest land for national forests, he was instrumental in extending the national forest area in Georgia and other States.

Senator Harris was interested in all phases of forestry development. It was through his efforts that a special appropriation was obtained for forest research work in the mountains of North Georgia, a project in which the Appalachian Forest Experiment Station at Asheville, N. C., co-operated with the Georgia Division of Forestry and the Georgia Agricultural Experiment Station. Senator Harris was also instrumental in establishing naval stores research work in the South.

At the annual meeting of State Foresters held last year in Georgia and Florida, Senator Harris was in attendance and made the Georgia portion of the foresters' tour, showing a keen interest in all that was said and observed. He was held in esteem by all the State Foresters and Federal Foresters. His removal is a distinct loss to forestry.



SENATOR WILLIAM J. HARRIS
Friend of Forestry

STUDENTS CONTEST FOR FORESTRY SCHOLARSHIPS

Examinations Were Held on April 23 in Which Over One Hundred White Vocational Agricultural Schools Participated.

An examination to determine who among the students of vocational agricultural schools of the State are entitled to attend the forestry camp this summer, was held April 23 at county seats.

The results of the examination will not be known until all the examination papers are carefully graded and a check has been made on each contestant's home project work.

Interest in the forestry camp has grown since the first was held and after those who attended reported to their schools how they enjoyed it.

Students who stood the best examination and did good work on their home projects, will win first and second prizes of \$50 and \$25 offered by Dr. Charles H. Herty.

The list of questions used in the examination is as follows:

1. Name 4 major jobs handled in your forestry school program.
 2. Name 10 important species of trees found in your community.
 3. Name uses of each of the 10 leading trees in your community.
 4. Describe different kinds of fire-breaks. What kind is best suited to your section?
 5. Give chief reasons why forest fires should be prevented? Give chief reasons for fires in your community and what you think could be done to prevent them.
 6. When should pine seed be collected and how should they be kept until planting time?
 7. Tell how to make and operate a tree seedbed for growing seedlings.
 8. Describe methods of planting pines in old fields; care of seedlings; tools used; soil preparation; spacing; depth of planting, etc.
 9. What general rules should be followed in thinning?
 10. What species of trees are most durable in contact with the soil?
 11. What trees are used extensively for producing veneer?
- (Continued on Col. 1, Page 2)

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.....Gainesville

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C. B. Beale, District Forester.....Waycross

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STUDENTS CONTEST FOR FORESTRY SCHOLARSHIPS

(Continued from Page 1)

12. What is meant by "DBH"? What is the length of a standard log?

13. Describe the use of a "Biltmore stick" in estimating board feet in a standing tree.

14. What do rings in a tree trunk indicate? What do the light and dark spots of a ring represent?

15. Describe work on your home project; (a) Size of tract; (b) Thinning done; (c) Number of trees planted; (d) Firebreaks constructed.

Plea of the Barren Place

Forested! Life!

My breast once bore old Nature's smile.
Beasts, with craftiness, hid their forms
In my dense growths, and waited long,
With patience, for their prey.
They shelter found
From nature's blast, and wildest storms;
And birds here made their song.

I weak'ning, wait,

For men to come, with knowledge gained;
'Twas in ignorance, that they wrought.

My hurts alone, I cannot heal;

Nor canst thou voice my plea.

Wife and I! Bare!

All wounds agape, with canker fraught,
I mutely woe what earth can feel.

—Mrs. Ida Wycott, Atlanta, Ga.



NEW STATE TREE NURSERY, ALBANY, GEORGIA, RECENTLY ESTABLISHED

ALBANY TREE NURSERY GETS UNDER WAY

Quick Work by Forestry Division Starts Crop of Slash and Longleaf Pine Seedlings.

The first of two new State tree nurseries was planted in the latter part of April at Albany. The Division of Forestry had much work to do to get ready, but the preparation was carried forward rapidly and efficiently. The problem of water was the first to solve. The City of Albany dug a six-inch well to provide water.

The Division of Forestry installed a pump, an overhead sprinkling system, prepared 90 seedbeds covering a little over an acre of land; removed Johnson grass roots, planted the seed and erected a pump-house and the first unit of a packing, tool and work house; an electric power line

was extended to the nursery, and a rapid transformation of an old field into a modern nursery is the result.

H. M. Sebring and H. D. Story, Jr., District Foresters, were actively in charge of the work and deserve much credit for what has been accomplished. Eitel Bauer, experienced and highly-trained forester, was employed on April 1 as superintendent of the nursery and will hereafter be on the job while the district foresters resume their regular duties.

The splendid cooperation of the City of Albany through the activity of the Chamber of Commerce, and particularly through the president of that organization, J. A. Davis, and Dougherty County, has contributed much to the undertaking, for which the Department of Forestry and Geological Development is very grateful.

The establishment of the mountain nursery near Blairsville is progressing with the prospect of completion in early May.

Blister Rust Quarantine

Georgia favors increased effort to restrict the white pine blister rust. State Forester B. M. Lufburrow has asked State Entomologist Manning S. Youmans, who is a member of the federal quarantine board, to exert his efforts to restrict this serious disease and keep it from spreading into Georgia.

It is the hope of the state forester that the white pine can be used to some extent at least to replace chestnuts of the mountains, now disappearing as the result of blight.

The blister rust has spread from Pennsylvania into seventeen states. Maryland, Virginia and West Virginia in the south have been reached. It is a serious disease that spends one period of its development on gooseberries and currants. The removal of these berry plants from the forest and for at least 900 yards distance from white pine trees is advised as a protective measure.

How Dogwood Got Its Name

A very astringent concoction used to be steeped from the dogwood and used to wash mangy dogs. That is how the tree probably got its name. The bark of the flowering dogwood yields quinine.—Service Letter Pennsylvania Department of Forests and Waters.

Clinton G. Smith, Athens, Tennessee supervisor of the Cherokee and Nantahal National forests in Tennessee, Georgia and North Carolina, was a recent visitor at the office of the Department of Forestry and Geological Development.

The Sahara Desert is moving southward at the rate of three miles a year, as the result of deforestation.

No one can afford to pay taxes on idle lands. Grow trees.

FOREST STAFF CONFERENCE REVIEWS FOREST FIRE WORK

Temporary Patrolmen During Fire Season Rendered Valuable Service —Recommend Continuation.

A meeting of the staff of the Division of Forestry of the Department of Forestry and Geological Development, was held in the first district at Dalton on April 5. The chief purpose of the conference was to discuss fire control work, particularly by the new work undertaken this year, represented by fire patrol work.

All district foresters were present and State Forester B. M. Lufburrow directed the discussion. Detailed reports were made of the various activities of the patrolmen, and of their effectiveness in creating interest among timber owners in fire control and the help they rendered in organizing and directing fire fighting.

It was the unanimous opinion that the temporary patrolmen had performed worth-

effectively by patrolmen was discussed. This, it was thought, would vary with the sections of the State.

As the result of interest aroused by patrolmen, new Timber Protective Organizations will probably be formed. Favorable reactions occurred among citizens quite generally from contacts made by patrolmen. Patrolmen were mature, capable men, some of whom had been employed at much higher salaries, but were temporarily out of work and glad to receive employment. Twenty men were used for about three months after the first of the year, on patrol duty.

Each district forester is compiling complete data as to the number of fires fought, number of miles traveled, number of conferences held, and other data showing what the patrolmen did. The reports are not complete at the time the Review goes to the printer.

The April issue of American Forests carries an interesting and beautifully illustrated article by Charles N. Elliott, district

AIRWAY PILOTS RADIO FOREST FIRES IN GEORGIA

Service Appreciated by Department of Forestry and Geological Development—Will Prove Helpful.

The American Airways, Incorporated, has offered to report all forest fires observed by pilots in Georgia to the Forestry Division of the Department of Forestry and Geological Development. This service is to be rendered free of charge.

In making the offer to the State Forester, Milt Saul, of the Southern Division of American Airways, Incorporated, says:

"These pilots would be glad to radio reports of fires from the planes immediately if you will designate proper parties to receive these reports. This service, of course, will be gratis on the part of the American Airways. Officials of the company feel that the advantages of forest fire control at the earliest moment is mutually advantageous to the State and to the airplanes. Continued fires add to the difficulties of airplane operations on the line."

The American Airways has double daily service over the lines between Atlanta and Birmingham, Atlanta and Montgomery and Atlanta and Chattanooga and, of course, to points beyond.

Speaking for the Commission of Forestry and Geological Development, Bonnell Stone, Development Agent, says that the offer is gratefully acknowledged and that the service will prove of great help in informing the Forest Service of the presence of fires so that district foresters can more quickly organize efforts for their suppression. Details are being arranged to obtain reports at the State Forester's office at the State Capitol, and State Forester B. M. Lufburrow will relay the information to district foresters.

MRS. JUDD ENTERTAINS COM- MISSION AND STAFF

At her beautiful home near Dalton, on April 5th, Mrs. M. E. Judd entertained members of the Commission of the Department of Forestry and Geological Development and members of the staff of the department. This was on the day following the quarterly meeting of the Commission in Atlanta, and a day when a meeting of the forestry staff was held at Dalton.

It was a delightful occasion, with a charming hostess entertaining at one of the most picturesque spots in Georgia, made beautiful by nature and by the art of landscaping.

A delicious luncheon, a visit to the terraced and sunken gardens, where flowers and shrubs grow in profusion, an inspection of the forests, and the camaraderie of congenial spirits made the event one to be cherished in memory by all who were privileged to attend.



(Above): Beautiful Home of Mrs. M. E. Judd, near Dalton, where Foresters were entertained. (Below): Group of District Foresters.

service. On account of the fire season coming earlier in South Georgia it was thought that patrolmen should enter the field before the first of the year.

The question of territory to be covered

forester at Augusta, the title being, "Feathers of the Okefenokee." Mr. Elliott visited the swamp with T. N. Burleigh, of the U. S. Biological Survey last November, to study bird life of that region.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

Burke County Interested

Interest has been aroused recently in Burke county in timber protection. Shortly after Mr. Bonnell Stone, Development Agent for the Commission of Forestry and Geological Development, talked with Colonel John J. Jones, of Waynesboro, the district forester visited Colonel Jones and found him intensely interested in the formation of a Timber Protective Organization for that county.

Through the cooperation of Colonel Jones and J. L. Bolton, Vocational Teacher in the Waynesboro High School, a meeting is to be held shortly in an effort to form a Timber Protective Organization.

Milledgeville Planting

The Forester of District 3 assisted in making an experimental planting at the Georgia Industrial School in Milledgeville. The seedlings planted on the farm at this school were the remainder of the season's crop of seedlings grown at the Forest School of the State College of Agriculture. The number was estimated by Professor Bishop Grant, of the college, to be approximately 100,000. The planting was late, the slash pine having growing tips.

The planting was done by the school boys of the Industrial School under the direction of Mr. R. E. Power. Mr. Power is an Austrian by birth and is in charge of the landscaping and plant cultural work at the school. He says that his ancestors have been foresters for 400 years in Austria and that he is the first to wander from that line of work. The school has already forested several of its barren hillsides under the direction of Mr. Power.

Jefferson County T P O

Forester of District 3 visited the Kiwanis Club in Wrens on Thursday, April 21, and made a talk to that organization about establishing a T P O in Jefferson county. Like several other counties in that section, much of Jefferson county burned over the last few months, and the landowners are now interested in protecting their wooded areas.

School Forestry Work

Competition in several schools in the Augusta District was keen during the past scholastic year and the forester is going to have a tough time in choosing the school for the first place in his district. The choice, however, will depend wholly on the amount and quality of work done by both teachers and pupils. The Georgia Forestry Association prize, as well as the prizes offered by Dr. Charles Herty, have stimulated much interest in the forestry program in vocational schools.

SIXTH DISTRICT

Jack Thurmond, District Forester
Savannah

Unprotected Timber Severely Burned

The sixteen counties in Southeast Georgia, which comprise District Six, and which are sometimes referred to as the "Flatwoods," have an average of 85 per cent timber land, or nearly three million acres, of which 110,000 acres are under organized protection as administered by six timber protective organizations.

In a report submitted by the District Forester of the Sixth District, at the last meeting of district foresters, it was shown that 67.8 per cent of all unprotected land in his territory had been burned over, but now since the first of April, approximately 80 per cent of the area has burned. Due to the powder dry condition of the vegetation and very high winds, which are unusual for that season of the year, a fire can travel faster than a man can walk. Fires have even burned over many acres which were burned during the fall fires of 1931.

During mid-April this season, this section suffered more from fires than for any other time during the season. Fires originating outside of T. P. O. lands have caused patrolmen lots of trouble. Water must be hauled for miles, as all streams and bays are dry.

Homes, barns, turpentine stills and other property have been destroyed by men who say they are trying to "secure" their property by "protective" burning, but who have had their fires turn on them and destroy everything in their paths. If there had been no firebreaks constructed by T. P. O.'s in this district and no fire pumps purchased, with which to fight fires, the damage would have been greater; even several small towns would have been destroyed.

Millions of turpentine faces have been destroyed by operators who raked and burned their timber, the fires burning the faces, regardless of raking. Firebreaks, fire pumps and organized fire protection are the only way to stop fires. Every operator and landowner is requested and urged to come to see, or get in touch with his nearest district forester and organize to control fires. At least 75 per cent of the fires which occurred this past year can be prevented next season. Firebreaks give one a place to go and fight a fire when it starts. Have you constructed any on your land?

Forest Patrolmen Effective

Three forest patrolmen (temporary) worked in District 6 for two and one-third months, beginning January 20 and continuing until April 1. During this time these men patrolled over 2½ million acres; contacted 750 land owners; fought and put

out 126 fires; put up 275 fire signs, and gave out 200 leaflets and other information to many landowners who are trying to protect their timber in sections where their land is scattering.

One of the most important things that these men accomplished was to gather information on the cause of fires, and it will be surprising to some to see a report which shows the causes on a percentage basis. Turpentine men caused 70.6 per cent of all fires, and stockmen 22.1 per cent. Other causes include railroads, campers, smokers and lightning, and were 7.3 per cent. These men encountered all kinds of people, both woods burners and men who are trying to protect their timber, and this question was asked each of them: What can the Forest Service do that will be of most help? What type of service do you need? There were nine different answers. Four hundred of them wanted a more severe law passed and enforced to punish woods burners, and only one man wanted nothing at all.

These patrolmen accomplished a great deal and 90 per cent of the landowners want them again next year from November till May.

Convicted for Woods Burning

At the last term of court, which ended April 13, in Hinesville, Liberty county, one man was tried and convicted for burning the woods. He was caught in the act, prosecuted by the landowner and received a sentence of twelve months in prison. Twelve more men are to be tried in the next term of court.

In Soperton, Treutlin county, two white men were caught, convicted and sentenced to one year each on the Prison Farm and that is at least two less woods burners for that county next season.

SEVENTH DISTRICT

C. Bernard Beale, District Forester
Savannah

High Winds and Drought Cause Major Fires

Persistent high winds and drought caused several major fires of huge proportion during the first part of April. These are the first serious crown fires covering large areas that have occurred in South Georgia in many years and it has severely taxed the resources of fire crews to control them. While fire breaks have been of value in checking the intensity of these fires, the accompanying high winds have thrown fire brands several hundred feet ahead of the fire, thus causing the original fire to spread with tornado-like velocity. Since all ponds and bays are dry, there have been no natural barriers to halt the progress of these great conflagrations, and it has required hard, continuous effort on the part of fire crews to hem in such fires with roads. Time after time it has been necessary

resort to backfiring as this has been the only opportunity for checking and securing such fires.

It has been through the ready response of citizens to these fires that it has been possible to prevent them from covering more area than they have. Many people are learning the technique of fire-fighting who before have never fought fire. By next season, there should be available a great number of experienced fire-fighters in this district, who will, because of this season's work, be prepared to cope with fires more efficiently.

Camping on Okefenokee Fire

Hamp Mizelle, patrolman for the Brunswick Peninsula Company's lands along the edge of the Okefenokee swamp, reports that he and a crew of men are camping on a fire just inside the swamp. The only method of fighting this fire is by trenching into the deep muck. By constant trenching and watching, Hamp hopes to keep the fire from "backing" out on the "hill" land, and thus save some splendid stands of pine adjacent to the fire area.

It is estimated by Hamp that several weeks will pass before the fire ceases to be a menace to the high pine land.

Tree Nursery Research

A contribution was made by the Commission of the Department of Forestry and Geological Development at its April meeting, to research work on tree nursery problems in which the Division of Forestry, the Georgia Agricultural Experiment Station and possibly the Federal Appalachian Forest Experiment Station at Asheville, will cooperate.

The research work will deal with nursery problems of Southern species of trees and Southern climatic conditions on which very little work has been done. Botanists and pathologists of the Experiment Station will handle important phases of the work. Important scientific contributions that may add to the best nursery practices, are expected to be the outcome.

Ashe, Pioneer Forester, Dead

William Willard Ashe, of the United States Forest Service, died March 18 at Washington, D. C. Mr. Ashe was known to many Georgians and was a contributor to a bulletin issued by the Georgia Division of Forestry, on cellulose. He was born at Raleigh, N. C., entered forestry work in 1892. He was a leading authority on forestry in the Southeast. At the time of his death he was senior forest inspector of the Eastern National Forest Region.

For several years Mr. Ashe was closely associated with State Forester B. M. Lufburrow when both were in the Federal service, and Mr. Lufburrow feels that a most valued and intimate friend has been lost.

MEMORIAL TREES PLANTED ON CAPITOL GROUNDS

One to Honor George Washington, the Other Governor Russell. Mrs. M. E. Judd Presents Specially Valuable Trees of Incense Cedar Family.

Mrs. M. E. Judd, Dalton, donated two trees of the species *Libocedrus decurrens* for memorial plantings on the State Capitol grounds, one to honor George Washington, the other Governor Richard B. Russell, Jr. The trees are specially valuable and belong to the incense cedar family. They were planted on the east side of the Capitol square, near the junction of Hunter Street and Capitol Avenue.

The *Libocedrus decurrens* is a rapid growing conifer attaining large size. Its foliage is somewhat similar to that of arbor vita. No species of tree now growing on the Capitol square will be more beautiful, and perhaps none will be more unique and striking. Trees of this species growing on the estate of Mrs. Judd at Dalton attract much attention and praise.

The two trees were planted according to instructions of Mrs. Judd, with the approval and appreciation of Governor Russell and under the direction of Development Agent Bonnell Stone, of the Department of Forestry and Geological Development.

Several other memorial trees have been planted from time to time to governors and other notables of the State. The tree planted in honor of George Washington was in line with the tree planting carried on over the whole country in celebration of the 200th anniversary of the birth of the "Father of His Country."

Cooperative Turpentine Studies

At the April meeting of the Commission of Forestry and Geological Development, an arrangement was made whereby cooperative studies will be made of factors influencing grades of turpentine produced by a modern steam still. This work is to be done by the Bureau of Chemistry and Plant Industry of the United States Department of Agriculture, which has a laboratory at Lake City, Florida. This research work is expected to develop valuable information in the production of naval stores products.

Warm Springs Foundation's Forest Fire Warnings

The Georgia Warm Springs Foundation has placed signs on its property that are so good that they are reproduced here.

"Do not throw away cigarettes or matches, or light any fires. Please help to bring good timber to maturity. Help the community to 'Keep out forest fires.'"

"Please do not pick the wild flowers or break the shrubs. Let our visitors enjoy them, too."

CHEMICAL FOUNDATION COMPLETES GEORGIA GIFT

Sum of \$50,000 for Paper Research Donated to Department of Forestry and Geological Development.

The donation of \$50,000 by the Chemical Foundation of New York to the Department of Forestry and Geological Development of the State of Georgia, for use in the paper research plant established at Savannah, was completed on March 30. John L. Kane, of New York, representing Francis P. Garven, president of the Chemical Foundation, brought to Governor Richard B. Russell, Jr., receipts and vouchers covering sums already expended on the project and a check to cover the balance, also a report to State Auditor Thomas Wisdom. The State officials accepted the gift, thanking the Foundation for its splendid contributions. Mr. Kane expressed the hope that the undertaking would prove successful and create millions in wealth for the South. He stated that the Foundation had supreme confidence in Dr. Charles H. Herty, who is in charge of the research project.

The State has set up \$20,000 for the plant for 1932 and will contribute a like amount in 1933.

FIERY DAYS IN BROOM SEDGE AND WIREGRASS LANDS

C. N. Willet, Augusta, Ga.

The damage and losses of 1931 through forest fires and the setback to our country's forests, are beyond all computation and the tragedy is that these fires were deliberately set and with a purpose by farmers, cattle owners and by men in general who, just naturally do not like to see, in the spring of the year a tall jungle of dead broom sedge or wire grass covering the terrain. And of course the extra heat and dryness of the season has turned every fire into a conflagration that has gone beyond all former boundaries in the matter of duration of fire and area as covered.

The autoist today, traveling along the Carolina coast, in South Georgia, and Florida, goes along a smoky, fiery pathway or else beside a blackened terrain. One can see, today, for miles through the forest. All grasses, seedlings and underbrush have been burnt. All living seeds in the ground have been killed. Through large areas half grown trees have been killed.

Fires that destroy all other grasses do not injure the roots of broom sedge and wire grass and these two grasses, thus made permanent on the land and which are practically worthless as cattle feed, and incite all of our forest fires, might rightly be called the two greatest plant devils of the South.

FORESTRY QUESTION BOX

What Is the Annual Potential Timber Growth of Young Trees?

The annual rate of potential growth of timber of all species of trees now too small to cut for cordwood in the United States is estimated at 3,590,000,000 cubic feet. Of this amount the Southeast is credited with 1,070,000,000 cubic feet. Other divisions are as follows: New England, 160,000,000; Middle Atlantic, 185,000,000; Lake, 815,000,000; Central, 250,000,000; Pacific Coast, 915,000,000; North Rocky Mountain, 190,000,000; South Rocky Mountain, 5,000,000.

Thus it will be observed that the Southeast is decidedly the leading section in potential timber production.

How Many Crossties Are Used Annually by Railroads of the United States?

In 1929 the number of crossties used was 95,521,000. Due to treatment for prolonging the life of ties, the annual consumption is being reduced. For the five-year period ending 1915, there was an average of 261 ties used for replacement annually per mile of roadbed; in 1929 the five-year average was 180 ties per mile annually.

How Much of the Forest Area of the United States Is Burned Over Annually?

About 9 per cent, or 45,000,000 acres. Over 41,000,000 acres, or 90 per cent of this area is in the Southeast. Much of the area of the Southeast is burned over annually, under the erroneous belief that fire improves pasture, kills boll weevils and snakes, and because turpentine operators think it a good way to protect cupped trees, not realizing that better results at cheaper cost can be obtained by using methods employed by Timber Protective Organizations of Georgia, and similar organizations in other states.

What Was the Original and What the Present Area of Forest Land in the United States?

The original forests embraced 800,000,000 acres, or more than half the land area of this country. The present forest area is approximately 506,000,000 acres, of which about 496,000,000 acres are classed as the area having commercial possibilities. The commercial forest area has increased in recent years through farm land passing back to forest land.

What Are the Leading Products Into Which Wood Pulp Enters?

Boards for cartons and other package forms are first in rank for consumption of wood pulp, amounting to 4,385,000 tons. Second in importance is newsprint (news-papers) which amounts to 3,813,000 tons; third, wrapping paper, 1,586,000 tons;

fourth, book paper, 1,474,000 tons; fifth, fine paper, 593,000 tons. These figures were for the year 1929.

Which Side of a Plank Should Face Outward?

The bark side. It holds paint better and finishes better. If a board has a tendency to sliver the slivers curve inward instead of outward.

What is the Difference in Strength of Wood When Green and When Dry?

Dry wood is as much as two and one-half times as strong as the same wood in the green, or natural growing state, says the Forest Service of the United States.

GUM OF SWEET GUM NEW USES NEEDED

Present Demand Amply Supplied — Forest Competition Severe.

In a recent article in the Louisiana Conservation Review, Dr. Eloise Gerry, of the United States Forest Products Laboratory, Madison, Wisconsin, sounds a note of warning against chipping new sweet gum trees, for the reason that dealers report a considerable surplus on hand at present.

Standardization of storax, the gum of the sweet gum, Dr. Gerry says, is needed to compete successfully with storax from Central America and the Orient, which is sold at low price and is in greater favor than American storax. New uses, she says, are needed to enlarge the demand.

The botanical range of red gum, or sweet gum, is shown on the accompanying map made by the United States Forest Service.

As will be noted, the growth of sweet gum centers in the Southern States, and next to the oak, sweet gum is the most prominent hardwood in the South. This, of course, indicates that storax production should center in the Southern States.

Georgia has opportunities for producing storax of which it has not yet availed itself. Very little production is reported from this State. While this is apparently not the time to launch into production, it is a good time to get information that will enable producers to start right and develop products of high quality so that Georgia will be able to successfully compete in the markets.

An illustration is given by Dr. Gerry as to the suggested method of chipping sweet gum trees. From the article, the following statement is reproduced:

"As far as woods methods are concerned, it is anticipated from present knowledge that in storax production, as in naval stores, methods of wounding that conserve the health and vigor of the trees will secure the most successful and sustained yield of storax. To this end such methods should be considered as pruning, and collecting storax from the bases of the branches or as low as possible on the main trunk, chipping twisted or badly deformed trees, or trees with decayed hearts, and operating on stands which are shortly afterward to be cut so that there will be a minimum of infection possible through the scars produced. It is significant that in the tests conducted by the Forest Products Laboratory in Louisiana in 1920, more storax was produced from trees with comparatively small streaks or grooves cut in them, than from girdled trees where a large surface was exposed."



Geographical Distribution of Sweet Gum. (Inset): Method of Chipping Sweet Gum. (Courtesy U. S. Forest Service).

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

CLAYS OF GEORGIA

Article 3

Clays mined in Georgia have an annual value of \$1,000,000 to \$1,500,000 and the supply is practically inexhaustible. The great thickness of the clay beds and the purity of the clays themselves are probably not duplicated anywhere else in this country. Georgia clay is highly valued wherever clay is used in this country.

Locations: Clays are developed commercially in widely different parts of the State, the most important deposits being the sedimentary kaolins that are found in the Coastal Plain, along the Fall Line between the Piedmont Plateau and the Coastal Plain extending from Augusta to Macon to Columbus. Mining operations have been carried on at Dry Branch, Twiggs county; Lewiston, Gordon, and Toombsboro in Wilkinson county; Hepzibah, Richmond county; Carrs Station, Hancock county; Butler, Taylor county; Stephens Pottery, Baldwin county; and Gibson, Glascock county.

A white clay occurs on Sweetwater Creek near Kelly's mill in the northern part of Sumter county, and clays have been discovered in the northern part of Randolph and the southern part of Stewart county. Deposits are exposed in cuts of the Central of Georgia Railway between Hatcher and Georgetown in Quitman county.

The crystalline areas of the Piedmont plateau contain a number of widely distributed small deposits of primary or residual kaolins. Among those of greatest promise are deposits near Union Point, Dallas, Porter Springs, Holly Springs and Jasper.

Bauxite and kaolins occur in Floyd, Barrow and Chatooga counties of Northwest Georgia, most of them being near Rome and Cave Springs. Impure kaolin derived from Knox dolomite has been utilized in Walker county, and at Aragon in Polk county. Clays are also found under the alluvial deposits in Dade and Walker counties. Alluvial clays found along streams of Middle Georgia are finding commercial use.

History: Smith, in Bulletin 44, of the State Geological Survey, says: "The sedimentary kaolins of the Coastal Plain of Georgia have been known since colonial times. Legend has it that the governor of the Province of Georgia learned of the secondary kaolins near Augusta and Macon and had some of the clay brought to Savannah, presumably by Indians in canoes down the Savannah river and the Ocmulgee andamaha rivers and shipped to the famous

Wedgewood pottery in England.

"Sholes, in his chronological history of Savannah, states:

"1741—Porcelain clay was discovered in or near Savannah by Mr. Duchet and china cups made. The trustees gave him fifty pounds sterling to encourage him in his enterprise."

"Minton states that 'As early as 1766 American clays from Georgia, Florida and the Carolinas were being sent to England in considerable quantities. These clays were regularly imported and used by Wedgewood until the clays of England were available.'

"The discovery and use of the English kaolins ended the mining of the sedimentary kaolins of Georgia for over a century. An American pottery and white ware industry gradually developed around two centers, Trenton, N. J., and East Liverpool, Ohio, using at first local clays and then domestic primary kaolin and imported Eng-

lish kaolin. The use of English kaolins as fillers in the manufacture of paper became firmly established.

"Not until 1876 was the mining of Georgia sedimentary kaolin revived. In that year the Riverside Mills of Augusta leased the Morgan property, nine miles southwest of Augusta in Richmond County, and for ten years mined kaolin, carted it to Augusta, used a portion of it in their product, and shipped the rest to northern and eastern markets.

"The next kaolin mining was in 1880 by J. R. Van Buren, of Griswoldville in Jones county."

In 1883 J. W. Huckabee opened a clay mine on the Central of Georgia Railway at Lewitson in Jones county. The not important clay operations at Dry Branch in Twiggs county were opened in 1897 by Payne and Nelson, followed by mining of the Georgia Kaolin Company in 1900; in 1902 by the American Clay Company and the Atlanta Mining and Clay Company.

The Butler Clay Company in Taylor county began operating in 1896. Golding Sons Company and the Albion Kaolin Company began mining in Richmond county.

Wilkinson county came into prominence as the chief producer in clay in 1910 when Edgar Brothers Company began operations.

Uses of Clays: Georgia kaolins are used for fillers, white ware and refractories.

The alluvial clays and shales are made into heavy clay products. As fillers, clay enters into the manufacture of paper, paper coating, rubber, oilcloth or linoleum, paint, paint pigment, plaster and plaster products, kalsomine and crayons.

For white ware, Georgia clay is used in making high class pottery, table ware, electrical porcelain, floor and wall tile, and sanitary ware.

Use in refractories include fire brick. The various clays of the state are suited to making fire brick for high, intermediate, moderate and low heat furnace duty.

The alluvial, or river-terrace clays of



Typical Clay Mine on Border between Coastal Plain and Piedmont Regions of State

middle Georgia, are used in the manufacture of building brick and structural tile. The shales of Northwest Georgia are made into building brick, structural and roofing tile and sewer pipe.

George I. Martin, teacher of vocational agriculture at McPhaul Institute, Sylvester, won the honor of being master vocational teacher of the entire south for last year, announcement of which has just been made from Washington. Among the projects in which Professor Martin ranked high was forestry.

If the market for timber is not right, one can wait, and the tree grows in the meantime.

NEW INSULATING FIREBRICK FROM GEORGIA CLAYS

**Light Brick with High Fusion Point,
No Appreciable Shrinkage as High
as 2,600 Degrees F.**

An important development in the use of Georgia clays is announced in the April issue of Technical Review. The discovery appears to open up an important new use for Georgia clays. The following is taken from the article in the Technical Review, prepared by Frederick H. Norton:

"For many years there has been a demand for a refractory having a resistance to heat of the same order as that presented by a high-grade fireclay brick, while at the same time having a degree of insulating power which would compare favorably with the better types of insulation. The brick should not only have a high fusion point, but it should be resistant to rapid temperature changes and should show no appreciable shrinkage at service temperatures which may go as high as 2,600 degrees F.

"The problem of developing such a brick has been carried on at the Institute for a number of years, and a product which showed very interesting possibilities was produced in small quantities. The material used for the brick was Georgia Kaolin, which is a very pure form of white clay. This clay has the high fusion point of 3,200 degrees, F. A great many difficulties had to be overcome in the development of this product since the kaolin has a very high shrinkage in firing and must, therefore, be burned to a temperature at least as high as the temperature that it will receive in use. Within the last year this brick has been placed in commercial production and most of the manufacturing problems have been solved.

"The brick has a weight of about 1.7 pounds, as compared with 8 pounds for a firebrick. Its thermal conductivity at 2,000 degrees F, is 3 as compared with 15 for the firebrick. One of the greatest advantages of this brick is that it can be sawed and filed into any shape with great ease, which makes it possible to form intricate shapes for special furnace parts with very little expense. Due to the extremely porous nature of the material of which the brick is made, it is rather permeable to gases, and usually the inside surface of the brick lining is coated with a thin layer of cement which seals the surface pores."

Arbor Day Stamp Honors J. Sterling Morton

In honor of J. Sterling Morton, through whose efforts Arbor Day was established, and as a memorial of the 100th anniversary of his birth, the United States Postal Service has issued a special stamp. These stamps went on sale at Nebraska City, former home of Mr. Morton, on April 22 of this year.

Plant Pines in Open Areas of Hardwoods

Pines grown in association with hardwoods improves the quality of pine timber, according to findings of the United States Forest Service. The hardwoods with their broad leaves create a density of forest shade that keeps down limb formation on tree trunks, thus eliminating knots and making clearer lumber.

Timber owners having hardwood forests may well plant in the open spots the species of pine best suited to the region.

NEW RESIN PRODUCT

Abalyn is the name of a new liquid rosin developed by the research laboratories of the Hercules Powder Company. It is described as a "resinous plasticizer for nitrocellulose lacquers and other products." The indications are that it will find wide application in the manufacture of clear interior lacquers for metal and wood alkali-proof lacquers, leather lacquers, coatings for fabric and paper, non-drying inks, rubber cements, adhesives, waterproofing compositions, transparent paper and similar products. It is insoluble in water and has a solvent action on practically all natural and synthetic resins, rubber and drying oils and is not corrosive.

New Treasurer

Mrs. Nellie N. Edwards, who has been secretary to the State Forester and accountant of the Department of Forestry and Geological Development, was made Treasurer of the department at the last quarterly meeting of the Commission. Mrs. Edwards was formerly connected with one of the leading banks of Atlanta and is an experienced accountant.

H. M. Sebring, District Forester, Macon, has backed his faith in the forests of Georgia by purchasing 1,400 acres of forest land in Telfair County. This property is in the Ocmulgee Timber Protective Organization and is, therefore, protected land.

Recent Publications

"Florida's Forest Land Problem," is the title of a bulletin recently issued by the Florida Forest Service. J. J. Goulden, assistant State Forester, is author. The publication treats especially of forest land income and taxes.

"Stumpage and Log Prices for the Calendar Year 1930," is the title of Statistical Bulletin No. 37 of the United States Department of Agriculture, compiled by Henry B. Steer. This publication gives valuable data on stumpage and log prices for the entire United States.

"More Turpentine, Less Scar," is the subject of Leaflet No. 83-L of the United States Department of Agriculture, Washington, D. C., prepared by Dr. Eloise Gerry of the Forest Products Laboratory, Madison, Wisconsin. Dr. Gerry has made many valuable contributions to the naval stores industry of the South.

LOOKING TO FUTURE IN DEVELOPING FORESTS

The Waycross Journal-Herald recently carried an editorial based on an address delivered by District Forester C. Bernard Beale before the Waycross Kiwanis Club, from which the following outstanding extracts are taken:

"This is a system of forest cultivation that looks to the future. It has in mind a section wherein there are always trees; a section wherein every timber owner has an annual income from his trees; a section wherein forestry represents a continuing, perpetual income.

"In contrast with this idea of taking care of the future is the policy of taking care only of the trees actually being turpented. Such a policy could be satisfied by raking and clearing around the trees being turpented and placing fire in the woods to run through the other trees and undergrowth on the land.

"It has been proved beyond any shadow of doubt in South Georgia that a forest policy of taking care of the present circumstances only means a steadily declining forest. Year by year the amount of forest in South Georgia has declined and the decline has been so rapid as to raise the question in many minds as to whether turpentine may not be a disappearing industry.

"In answer to such a question is the absolute conviction of trained foresters that the income from turpentine, the income from saw mills, and other timber income can be made a perpetual, annual income. These trained foresters have no doubt in their own minds that South Georgia, above all other sections in the United States, can be made a section where there are always trees to be turpented; where there are always trees to be sawmilled and where the timber owner may know that money invested in trees will pay a handsome interest every year.

"Such a development for South Georgia as Mr. Beale warns us, is and must be dependent upon the state of mind of the people in South Georgia. If the South Georgians themselves believe forestry is purely a matter of taking care of present commercial timber operations, South Georgia and not outsiders will defeat the timber future of South Georgia."

Assembling Plant for Turpentine Interests

The Turpentine and Rosin Factors, Incorporated, is erecting an assembling and distributing plant at Valdosta. Large tanks are being installed. Turpentine will be stored in the tanks and transferred to tank cars and shipped from time to time as the trade demands.

Burned and dry faces of turpentine trees can produce a flow of nothing but tears of the turpentine operator

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
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Governor Roosevelt's Forestry Message to Georgians From Warm Springs

To the Forestry-Geological Review:

"For many reasons the whole economic future of Georgia depends on the proper use of land. That is why it is of the utmost importance to encourage a complete survey in order to determine what land is best suited for agriculture and what land should be devoted to the raising of tree crops. Outside of comparatively small recreational or scenic areas, forestry conducted on planned business lines is coming to be recognized as vital to the future wealth of the country. Supervised reforestation is no longer a sentimental ideal but has become a practical necessity.

"FRANKLIN D. ROOSEVELT."

Governor Franklin Roosevelt of New York is an enthusiastic friend of forestry, evidenced by his forestry program in New York and his membership in a Georgia Timber Protective Organization at Warm Springs, Ga. He is cooperating wholeheartedly in carrying out the program of the State Division of Forest Service of Georgia in forest fire protection. It is, therefore, an honor and a privilege to carry the above message from his Excellency, a message sought and obtained by District Forester W. G. Wallace of Columbus. The Meriwether County Timber Protective Organization, with which Governor Roosevelt is identified, is one of the best

equipped and most efficient in the State. The 15,000 acres of timberland on Pine Mountain has a steel fire tower, fire fighting truck, fire break system, one patrolman and organized crew of willing fire fighters ready to respond day or night to a call for fire service.



Meriwether County T. P. O. Left, Fire Fighting Truck; center, Fire Tower on Indian Mountain; right, Franklin D. Roosevelt, Member of Organization.

GEORGIA AT STATE PARKS MEETING IN MAY

Georgia was represented at the National Conference on State Parks held at Virginia Beach in May, by Mrs. M. E. Judd, Marion Bonnell Stone, Oxford, Judge Ogden Persons, Forsyth, Miss Emily Woodruff, Vienna, and Miss Mary Persons, Forsyth.

SERIES FORESTRY ARTICLES BY DISTRICT FORESTER

C. Bernard Beale, District Forester at Waycross has been asked to contribute a series of articles on Forestry to the Waycross Journal-Herald. These articles are now appearing and are doubtless read with much interest in a region where forest products are of fundamental commercial importance.

FOREST CAMP WINNERS IN STUDENT CONTEST

Many Close Contests—Character of Papers Higher Than Last Year—Each Contestant Had Home Project. Winners Last Year Enthusiastic and Keen to Return to Camp.

The examination papers have been graded and the contest for camp scholarships is over. Those who have won the honor of attending the second Vocational Forestry Camp at Young Harris College July 25 to August 15 are named below, and also the names of students who won scholarships last year and are entitled to complete their camp work this year are given.

The number of students contesting this year was greater and the character of papers was higher than last year, showing a greater interest in forestry among the students of the agricultural vocational schools of the state.

Nearly one hundred schools were represented in the contest, each school sending in three examination papers.

Each contestant this year was required to have a home forestry project, and one of the examination questions called for a description of the student's home project. The teacher of each school was required to grade the home project and also the general scholarship, character and fitness of each contestant.

Students who attended camp last year and secured passing grades are permitted to return to camp for three more weeks and complete the camp work, which, when satisfactorily done, will entitle them to certificate of "Vocational Forester".

The winners of scholarships in the examinations this year and alternates who were second in examination tests and are entitled to scholarships in case the winner cannot go to camp are as follows:

Banks county, J. C. Daniel, James Hill, Banks county High School; Barrow county, Lamar Patrick, Champ Jackson, Winder High; Berrien county, William Scarborough, Wilson Knight, Nashville High; Bibb county, Joe Adams, Homer L. Calhoun, Jr., Lanier High; Bleckley, Bill Warren, Clinton Hartley, Middle Georgia College; Bulloch, Frank Proctor, Brooklet High, J. W.

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Bonnell Stone, Oxford, Development Agent

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E. B. Stone, Jr., District Forester,

Gainesville

H. M. Sebring, District Forester.....Macon

C. B. Beale, District Forester.....Waycross

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George C. McNaughton.....Asst. Research

Bruce Suttle.....Plant Engineer

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J. B. Osborne.....Plant Assistant

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Chattooga, Elmer Hendrix, Clarence Hawkins, Gore High; Cherokee, William Logan, Wilber Porter, Reinhardt College; Clarke, Grady Pittard, Roy Mills, Winterville High; Cobb, Lake Poteete, Leonard Westmoreland, Blackwell's High; Colquitt, Eugene Adams, David Newton, Moultrie High; Cook, Quinton Mathis, Jack Wise, Sparks-Adel High; Dawson, Theo Hughes, Malcolm Roper, Dawsonville High; DeKalb, Etheridge Keith, Raymond Lloyd, Chamblee High; Elbert, W. O. Hudson, Jr., Nancy Hart Memorial, Hugh Butler, Bowman High; Emanuel county, Truett Drake, Delmas Pope, Adrian High; Fannin, J. D. Cowart, E. Howard Tatum, Epworth Seminary.

Franklin, James Gillespie, Leon Crump, Franklin High; Gilmer, Willard Fain, William Smith, Ellijay High; Gordon county, J. W. Butler, J. J. Acree, Sonora High; Gwinnett, Carson Britt, Frank Moon, Snellville High; Habersham, Grady Lumpkin, J. L. Shirley, Hollywood High; Hart, James Cochran, Shoal Creek High, Jewell Hembree, Sardis High; Heard county, Lewis Weaver, Solon Owensby, Franklin High; Jackson county, Ulysses Carlan, Eugene Ducks, Commerce High; Jefferson, Clinton Willard, Harris Minus, Wrens High.

Johnson, Dupree Price, Sam Weeks, Kite High; Lamar, Charles M. Smoak, Jr., J. B. Hickman, Georgia Industrial College; La-

nier, James Conine, Lewis Snowden, Crisp Consolidated; Laurens, Parker Bedingfield, Bennett Colter, Cadwell High; Long, Julian Smith, Walter Micham, Ludowici High; Madison, J. D. Echols, John Quincy Jones, Madison County High; Mitchell, Lee Roy Thomas, Herbert Henson, Pelham High; Morgan, Benjamin Gay, Lamar Mowell, 8th District A & M.

Rabun county, Gladstone McClain, Earl Keriner, Rabun Gap Institute; Stephens, Edgar Kellar, Carl Rothell, Eastanollee High; Stewart, Chas. C. Mathis, A. C. Trotman, Richland High; Sumter, Elmer Larson, Elmer Goodrum, Union High; Taylor, Harley Gaultney, Cecil Parks, Butler High; Terrell, Earnest Lee, Orville Johnson, Graves High; Tift, J. W. Jones, Emmett House, Omega High; Thomas, Herman Braddy, Tharran Connell, Pavo High.

Toombs, Delmas Galbreath, Wilbur Blount, Vidalia High; Treutlen, Hugh Gillis, M. R. Thigpen, Soperton High; Troup, Robert Johnson, Elmer Covin, Hogansville High; Ware, Jas. H. Underwood, Jr., Victor Callahan, Waresboro High; Wayne, Floyd Morgan, J. B. Oliff, Screven High; Webster, John Wesley Alston, Buddy Block, Union Consolidated; Wilkes, Sim Lynn, Charles Garrard, Washington High; Whitfield, John Bond, Mac Rollins, Dawnville High; Worth, Jack Paul, Edmond Fletcher, McPhaul Institute.

OLD STUDENTS RETURNING TO CAMP

Berrien county, Lester Golden, Nashville High; Bibb county, Joe Johnston, Lanier High; Bleckley, George Norris, Middle Georgia Junior College; Bulloch, Robert C. Hall, Brooklet High; Burke, J. R. Stafford, Jr., Girard High; Carroll, Horace Ayers, 4th District A & M; Chattooga, Frank Hendrix, Gore High; Cherokee, Fred Harris, Reinhardt College; Colquitt, Ralph Watson, Moultrie High; DeKalb, Marvin Floyd, Chamblee; Emanuel, Robert C. Radford, Adrian High; Elbert, Harry Seymour, Bowman High; Fannin, Garnett Craig, Epworth Seminary; Franklin, Bill Sanders, Franklin County High; Gordon, Ansel Mealor, Sonora High; Habersham, H. J. McCurry, Hollywood High; Hart, Clayton Cordell, Nancy Hart Consolidated; Heard, Sidney Jackson, Centralhatchee High; Jackson county, Howard Carlan, Commerce High; Jefferson, Glen Rhodes, Stapleton High; Johnson county, Buren Claxton, Kite High; Lamar, Arthur Steedly, Georgia Industrial College; Lanier county, Wesley Moore, Crisp consolidated; Laurens, Herman Gilder, Rentz High; Madison, Clarence Carson, Madison County High; Mitchell, Fulton Morey, Sale City High; Morgan, Alvin DeLoach, 8th District A & M; Newton, J. C. Ellington, Palmer-Stone High; Stephens, Weldon Spearman, Eastanollee High; Stewart, Ben Sherline, Lumpkin High; Sumter, C. W. Grant, Union High; Terrell, Howard Adams, Graves High; Thomas, Clarence Edmondson, Pavo High; Toombs, Ezra Taylor, Vidalia High; Troup, William Johnson, Hogansville High; Treut-

len, Jim L. Gillis, Jr., Soperton High; Walton, Broadus Orr, Georgia Vocational and Trades College; Ware, Bill Seaman, Waresboro High; Wayne, Julian Royal, Screven High; Webster, Edmund Dillard, Union Consolidated; Whitfield, Joe Hair, Dawnville High; Wilkes, George Garrard, Washington High; Worth, Herman Tyson, Sumner Consolidated; Gilmer, C. A. Rodgers, Gilmer County High.

COLORING WOOD OF TREES THROUGH SAP TREATMENT

**Mahogany, Rosewood, Ebony and
Other Colors Can Be Given by In-
jections—Leaves Also Colored.**

Dyeing living trees to produce colored wood, according to John James Meily, American Consul at Hamburg, Germany, has been achieved by a German concern which holds the process as a secret.

By this process it is claimed it is practical to dye or color both the wood and the leaves of living trees any predetermined color and shade. This is accomplished by injecting coloring matter into the sap circulation. The entire cellular structure of the tree and limbs can thus be given a uniform tint of mahogany, rosewood, ebony or other desired color.

It is also claimed that by introducing various colors into a living tree in certain ways and at different periods, a mottled or "marbled" effect can be obtained. Thus a unique wood for furniture may be made available without painting.

The inoculation, it is reported, is made when the sap is rising in the spring and summer and the dyed trees are felled soon after. The advantage claimed is that the color can be given at low cost, that when given a coat of varnish, the wood grain is not dulled or obliterated when colored with paint on the surface, and that the cost of varnish is all that is required to revive the original beauty of the grain and color. It is also claimed that the coloring process renders the wood resistant to wood destroying insects.

SWAMP BURNED THREE TIMES IN RECENT MONTHS

During the prolonged drouth in South Georgia, swamps have dried up and the organic matter that constitutes their soil is capable of burning. An instance where a swamp had been burned over three times in recent months was recently observed by Development Agent Stone and State Geologist McCallie in South Georgia. Each fire had burned a layer of soil. When rain again is sufficient, the swamps will fill up, and where the soil was burned there will, of course, be water. This is likely to bring about changes in the vegetative life of the burned swamps.

PAPER PLANT PROGRESS EQUIPMENT INSTALLED

Various Contributions of Supplies and Equipment Made Evidencing Good Will for Research Plant.

Steady progress has been made during the past month on the infinite details connected with the equipment of the laboratory at Savannah.

The delayed parts for the digester have been received, and all of the equipment has been installed.

The next two weeks will be devoted to "breaking in" the various parts of the machinery; making a few preliminary cooks of the digester in order to gain the experience necessary for handling materials systematically; experimenting with various types of surfaces on the grinding-stone; and to remedying leaks and correcting adjustments of a minor nature on all the machines.

Thanks to the generosity of the lumbermen of Savannah and the generous assistance of the contractor, we have been furnished without cost with rooms serving as offices, a pamphlet room, a storeroom for supplies, and a shower-bath and dressing-room for the staff.

The operating expenses have been considerably lessened by the generous contribution of all the lime required for the year by the Ladd Lime and Stone Co., of Carlsville, Ga., and by the joint contribution of all the liquid sulphur dioxide necessary, by the Texas Gulf Sulphur Company of New Orleans, La., and by the Calco Chemical Company of Bound Brook, N. J. which in turn converts the gas into liquid sulphur dioxide without charge. We are also indebted to duPont Company for a contribution of dyes of the type used with mechanical pulp.

The paper machine is now fully equipped with its clothing and is ready to fabricate paper pulp into finished paper as soon as the preliminary studies are thoroughly under way.

Chas. H. Herty,
Research Chemist

May 17, 1932.

STONE AND MALLORY ATTEND CLAY HEARING

Development Agent Bonnell Stone and J. M. Mallory, member of the Commission of Forestry and Geological Development, visited Washington in the interest of Georgia. They attended the hearing before the Ways and Means Committee on May 12, before whom Dr. Chas. H. Herty appeared as the principal speaker regarding tariff adjustment on clays to utilize the depreciated currency of Eng-

CHEMICAL MEDAL GIVEN DR. CHAS. H. HERTY

For Outstanding Contribution to Science of Chemistry of America—Notable Honor for Georgian.

The formal awarding of a medal to Dr. Charles H. Herty for "noteworthy and outstanding service to the science and profession of chemistry in America", by the American Institute of Chemists, in New York in May, was an occasion that attracted comment throughout the nation. The medal was presented by President Francis P. Garvan of the Chemical Foundation, Incorporated, of New York. The formal address was made by Dr. Frederick E. Breithut, President of the Chemical Institute. The following extract is taken from Dr. Breithut's address:

"We honor a man who has given his life equally to chemistry and to his fellow-chemists. As an experimental scientist, Dr. Herty worked out improvements in the turpentine industry which have meant more than ten million dollars annually to the South.

"Recently Dr. Herty has returned to his laboratory and is at work on another problem of national importance. His process for making paper pulp from slash pine will build up a great new Southern industry and it may well restore the prosperity which has disappeared with the falling price of cotton.

"Most chemists learned to know Dr. Herty, however, while he was working in their behalf as president of the American Chemical Society and later as editor of Industrial and Engineering Chemistry. His fight for adequate legislation helped build up a real chemical industry in this country and he continued this splendid work as adviser to the Chemical Foundation.

"During all this time he had one guiding idea—that American chemists, if given the opportunity, could free the country from dependence on foreign chemicals. He insisted that this opportunity be provided and, fortunately, his efforts were successful.

"In this work, as well as in that for the National Institute of Health, Dr. Herty's motives were unselfish. He has received as an unsought reward the affection of his fellow-scientists and that is why it gives us all such real pleasure to present him with this medal tonight."

Millions Benefitted by Forests

"The harvesting of timber, the manufacture, transportation, distribution and re-manufacture of forest products, and all the supplies and services that are wholly or partly dependent on the timber industries, vitally affect the livelihood of at least 10,000,000 people, counting the families of those directly employed."—U. S. Forest Survey.

FORESTRY RALLY HELD AT SOPERTON SCHOOL

School Forest Cabin Dedicated, Barbecue Held, Prominent Speakers Heard, Motorcade to Fowler Plantations and T. P. O.

The dedication of a school forest cabin of the Soperton High School was made the occasion of a great forestry rally at Soperton on May 26. The rally was arranged by Professor R. D. Pulliam, vocational agricultural teacher, and Jack Thurmond, district forester. The program consisted of speaking, a barbecue and motorcade to Fowler and Gillis Plantations and to the Treutlen County Timber Protective Organization. The attendance was 275.

Exercises opened with a welcome address by Hon. Neill Gillis, mayor of Soperton. Colonel Stallings, chairman of the County Board of Education, spoke highly of the work in forestry conducted by Professor Pulliam and congratulated the school on its school cabin.

Bonnell Stone, development agent of the Division of Forestry and Geological Development, complimented the citizens of Soperton and Treutlen county for their encouragement of the forestry work of the Soperton High School and for the splendid work done. He pointed out promising new uses for Georgia pines, especially in the paper pulp industry and declared that Georgia's progress will depend largely on how well it develops its forestry resources.

Dr. A. V. Henry, Georgia School of Technology, spoke on the relation of the clays of Georgia to paper manufacturing.

Hon. Leonard Rountree, Summit, member of the Commission of Forestry and Geological Development, made a stirring speech on the need of fire protection and said that the trees afforded the surest crop and the easiest money crop of the farm.

J. M. Mallory, Savannah, member of the Commission on Forestry and Geological Development, spoke of the service the Commission is rendering the timberland owners, of the free service the district foresters are tendering and asked property owners to get in touch with these foresters.

Claim T. P. O. Record

Jack Thurmond, Savannah, claimed that the Treutlen County Timber Protective Organization had the best record in the state for 1932. Of the 29,000 acres in the organization, only 300 were burned in 1931. He invited any property owner present who did not belong, to join and succeeded in signing up 4,000 additional acres to the existing organization.

Professor Pulliam explained the work done in the school forestry project, reported great interest among the students and thanked District Forester Thurmond for his valuable assistance.

(Continued on Page 8, Column 3)

FORESTRY QUESTION BOX

What is the annual growth per acre on average sites of loblolly, longleaf, shortleaf and slash pines?

United States Miscellaneous Circular 50 gives the following acre yields for average sites:

Species	Maximum average annual growth per acre	40 years total volume per acre
Loblolly	750 bd. ft.	28,500 bd. ft.
Longleaf	573 bd. ft.	17,000 bd. ft.
Shortleaf	558 bd. ft.	17,800 bd. ft.
Slash	567 bd. ft.	22,000 bd. ft.

What conifers in the United States grow the fastest?

If one were to take the number of years required to grow a tree, 8 inches in diameter, the following is the order in which trees are listed: Redwood, loblolly pine, Douglas fir, slash pine, longleaf pine, white pine, shortleaf pine, white fir, ponderosa pine, jack pine, red spruce.

What do light and dark bands in an annual ring growth of a tree represent?

In the recent forestry examination held for vocational pupils of the state, no question was more generally missed than this. The light part of the ring represents spring growth and the darker part, summer growth.

How much more water does a forest soil absorb than the soil of a field?

Dr. J. T. Auten of the Central States Forest Experiment Station found that the top inch of forest soil in a normal, protected woods absorbs 47 times as much moisture as the top inch in an abandoned field; that the third inch in depth in the woods absorbs 15 times as much, and the eighth inch $2\frac{1}{2}$ times as much as the same depths absorb in an old field. Pasture lands absorb more than bare lands, but not as much as wooded lands.

Do forests increase rainfall?

Forests increase the moisture content of the air, but do not materially influence the air very far above the forest. It is doubtful that forests have more than a local influence, and to no great extent even locally. Rains in the south are mainly created by moisture carried up from the Gulf or Atlantic ocean.

"The experience of years has shown that cutting prices will not have the effect of selling any more lumber than would be sold if the prices were not cut. Worse than that, cutting prices actually deters buying; buyers are traditionally reluctant to buy on a declining market. Writing whining, crepe-hanging letters and issuing cut-price lists can have only one effect, and that effect is one of depression." — Southern Lumberman.

FOREST PLANTING COSTS ON NEWMAN FOREST

According to figures obtained by District Forester W. G. Wallace the number of trees planted and cost of planting on the Newman town forest are as follows: 23,000 pine seedlings at \$2.50 per thousand; 2,200 black locusts at \$2.50 per thousand; 2,000 black walnuts at \$15. per thousand, made a total cost of planting stock \$93.50. Labor cost of planting was \$84.88; express \$20.15. Total planting cost for 1932 was \$198.13. Average cost per acre \$4.13.

Loblolly and longleaf pines were spaced 7 by 8 feet, but every fifth longleaf pine was supplanted by a black locust. Walnuts were planted 20 by 20 feet.

Twelve acres were planted to loblolly; 17 acres to longleaf pine and black locust, one acre to slash pine and 18 acres to black walnut. The pines were planted February 4-10; walnuts February 26-27. Conditions were favorable for planting and the survival is good.

FORESTRY ASSOCIATION COMMITTEE ENTERTAINED

Judge Ogden Persons, Forsyth, member of the Executive Committee of the Georgia Forestry Association, entertained the committee and other invited guests at Indian Springs on April 29. This is the second year that Judge Persons has entertained the committee at Indian Springs, and both have been very enjoyable occasions.

The chairman of the executive committee, C. B. Harman, presided. The business consisted of perfecting the program for the annual meeting of the association at Rome. Inspiring talks were made by President T. G. Woolford, Atlanta, Jack Williams, Waycross, Joseph A. McCord, Atlanta, Judge Ogden Persons, Forsyth, Prof. Jack Dempsey of Jackson, Miss Emily Woodard of Vienna, J. M. Mallory, Savannah, Bonnell Stone, Oxford, and others.

Luncheon was served at the Elder House, with Judge Persons as host, following which the executive committee concluded its business.

SENATOR GEORGE ON NATIONAL FOREST RESERVATION COMMISSION

Senator Walter F. George has been appointed to the vacancy on the National Forest Reservation Commission on the acquisition of national forest lands formerly occupied by the late Senator William J. Harris of Georgia. The appointment of Senator George is highly gratifying to people of Georgia who are interested in forestry. The Commission is made up of two United States senators, two congressmen, the Secretary of War, the Secretary of the Interior and the Secretary of Agriculture.

FIRE AND LONGLEAF SEEDLINGS

Paul V. Siggers of the Bureau of Plant Industry of the United States Department of Agriculture, gives the results of forest fires on longleaf pine seedlings in Louisiana, in the May issue of the Journal of Forestry.

It was found that fire burning annually for six years caused a mortality of 8 per cent of young longleaf pines and delayed the growth of the survivors by destroying the terminal buds. On an adjacent unburned tract the mortality of seedlings for the same period was only 4 tenths of one percent.

One of the diseases of pines in some parts of the southern pine belt is the "brown spot", a needle disease. It has been claimed that fires tend to reduce damage from this cause. Observations were made by Mr. Siggers on this point who reports that a single fire reduces brown spot needle disease for the following season, but by the end of the second season the influence of fire on this disease was negligible on two of the plots, and on the third, the amount of the disease was one-half of the unburned area.

SALVAGING FIRE WASTE IN JESUP REGION

Fifty Men Find Jobs Cutting Timber of Burnt Over Land—A Worthy Example.

The following taken from the Jesup Sentinel is self explanatory:

"Fifty men are at work this week salvaging burned over timber on lands of A. F. Knight, local naval stores operator and pharmacist. These lands lie east and south of Jesup, nearby, and the fire practically destroyed all growth on 2,000 acres or more.

"Men, mules, oxen and a skidder are already at work getting out this timber which is cut into lengths suitable for market. A saw mill will be installed immediately for transforming the logs into merchantable stocks for the market. Several large orders for lumber of different dimensions are to suit local timber products have been received. Others are expected to come as fast as needed to use up the output.

"Salvaging timber from these quarters entails overcoming considerable difficulties. Most of the timber lies in a burned out tract covering a mile each way in area. The problem is to salvage the timber while the weather is dry and from the interior of the rough country where trees have fallen or are scattered for miles. But the forces have gone out at it with vigor and as much as 50,000 board feet of timber a day are being cut."

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Taylor-Talbot T. P. O. Lists Additional Acreage

An additional 6,400 acres has been listed in the Taylor-Talbot Timber Protective Organization which brings the total area protected to 21,400 acres.

Mr. W. A. Payne, President of the Taylor-Talbot T. P. O., constructed a firebreak around his entire timbered area recently by plowing out a strip about ten feet wide. The cost of constructing this firebreak averaged approximately five dollars per mile. However, this initial high cost was due to the necessity of grubbing and clearing the strip before plowing. Mr. Payne is a great believer in protecting the forests from fires, and has already materially benefited from his firebreak which was of assistance in stopping a recent fire.

Partial Success Attained in Direct Seeding

Mr. T. J. Fountain and his son, A. J. Fountain, have succeeded in securing a good stand of longleaf pine by the direct planting of the seed in the field. Under certain conditions direct seeding for longleaf pine might be recommended, but as a general rule the planting of one-year old nursery grown pine seedlings is the most generally successful and cheapest in the long-run.

Having collected his own seed and planted them in an open field of soil favorable to the longleaf pine, and with an abundance of idle farm labor, Mr. Fountain can now be said to have attained success as the seed was not eaten by birds or rodents and has sprouted well. However, on certain areas a very unsatisfactory stand was obtained, due to two causes. It is fairly evident that rodents destroyed the seed on a low area near woods which harboured the rodents. Lack of success on other areas was due to planting too late, which was in February.

It can readily be seen that there are a large number of factors which enter into the success or failure, both financially and as to stand, of using the direct seeding method.

Mr. Fountain experimented extensively, even broadcasting the seed on a certain area. The broadcasting method proved a complete failure. The most consistent good results were obtained by planting about six seeds (pine mast) in shallow drills six feet apart each way, and barely covering them with soil. A layer of pine straw was then placed over some of the drills but seemed to add nothing to the success of the sprouting of the seed. Good sprouting of the seed was secured in one field by stick-

ing single seeds in the ground and spaced about four feet apart.

Of the conclusions drawn from this experiment that of planting the seed early, preferably in December or early January, seems paramount. This seems to be in accordance with natural conditions as longleaf pine generally sprouts in the fall of the year.

It would be advisable to consult your district forester before undertaking this method of reforestation.

FIFTH DISTRICT

H. M. Sebring, District Forester
Macon

The consideration of cropping land for forest trees, similar to raising agricultural and orchard crops, seems to be gaining more converts every year. In addition to fire protection, planting, and thinning, a number of land owners are plowing cut-over land to prepare the soil for the next crop of trees. Where seed trees are present the solid plowing of the land will serve three functions: first, it will prepare the soil for better reception and establishment of the seedlings; second, it will reduce competition from weeds and grass; third, it will reduce the fire hazard by eliminating a large percentage of the wire grass sod.

T. H. Jackson, patrolman and manager for Bray-Giddens Company on their tract of cut-over land in Telfair county, plowed some land last fall to experiment with the idea of preparing land for seed reception. He plowed before the seed fell and finds a much greater percentage of longleaf seedlings were established on the soil he prepared than on the part given no preparation. In his section of Telfair county, it looks like there will be a good crop of longleaf seed this year, so he contemplates doing more plowing on a larger scale. The cost will not be excessive as he can use labor and teams that are not doing any work at the time and would never-the-less have to be fed.

Landowner Raises His Own Seedlings

A. L. Jones, a turpentine operator and farmer of Lumber City, is very enthusiastic over the possibilities of raising pine trees. He has been protecting his land from fires for a number of years, and has done some planting this past winter. He decided to raise some seedlings of his own so made a small nursery of 6 beds each 125 feet long, and planted 25 pounds of slash pine seed. Mr. Jones contemplates raising 150,000 slash seedlings for fall planting, or enough to plant approximately 300 acres of land. He is giving his seedlings close attention by watering them every day it doesn't rain and weeding them whenever necessary.

Last fall he also plowed solid thru parts of his woods, and grubbed out a lot of gallberry. He says, "That's the only way to

keep down the fires and make the trees grow fast." He figures the plowing didn't cost him much because his labor and teams were not needed for other work at the time. Breaking woods land this way is an economic saving thru increased growth and reduced cost of fire protection.

SIXTH DISTRICT

Jack Thurmond, District Forester
Savannah

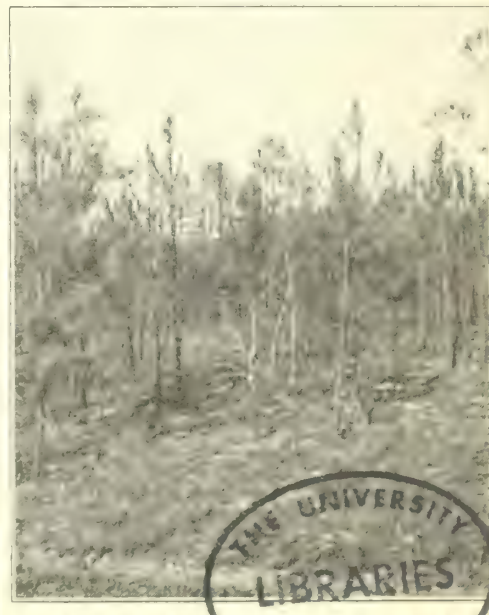
Growing Pulp Wood in Liberty

Mr. W. I. Stafford, Patrolman of the Liberty county T. P. O. and fire fighter par excellence, sees a bright future for timber growers in this section, and the whole secret lies in fire protection. Mr. Stafford says:

"Since Savannah, Georgia, has been successful in locating an experimental mill where experiments will be conducted on all woods suitable for paper pulp and accurate records of their results kept, it behooves us, the timber growers and citizens of Liberty county to grow a supply of raw material so that we may induce large commercial mills to come to this section and locate, as former experiments show that a splendid grade of paper can be made from young slash pine and we all know that there is no better section in Georgia for growing slash pine than Liberty county.

"How long could this section of Georgia supply a large mill using as an average 700 cords of wood per day? If we were guaranteed at least \$6.00 per cord for young unburned slash pine which we would naturally have to remove as thinnings if we never burned our woods, would any of us be interested? And would we be benefitted any?

"Picture if you can the wonderful stand of young slash pine we had all over this section in the fall of 1931. Also the heavy



Promising Young South Georgia Forest Killed by Fire

seed crop the mother trees and nature scattered.

"Now take another ride over the same section and see for yourself just what destruction we have caused by setting out fires and letting them get on to our neighbors' land. There is nothing now for a paper mill to come here for, and certainly no turpentine timber and fire wood are left.

"Forest growth is slow, 'Fire destroys quickly.' It takes a life time to establish a good character. It can be destroyed in one minute by taking the wrong step.

"Other counties are planting slash pine by the thousands. We folks living in Liberty county don't have to plant them, but the other fellow may beat us growing them, for they do not burn the woods. A good growth of young slash timber will bring more money into Liberty county than anything else we can do and if every one will remember that 100 years of Nature's work can be destroyed in 10 minutes by fire we will do lots toward getting this county fully timbered."

Treutlen T. P. O. Has Good Fire Record

Treutlen T. P. O. probably has the best fire record of any T. P. O. its size in the turpentine belt. The organization contains 26,000 acres and the membership includes five men, all every inch a fire fighter. They had plenty of fires to start, in fact 19 fires were fought which burned 850 acres as a total. These men in the organization are talking fire protection and practicing it 12 months during the year. They are also firm when a woods burner is caught as they convicted two there this past year for burning woods.

Temporary Patrolman Re-employed in Liberty

The fire situation became so acute in District Six during the middle of April that it was deemed advisable to put H. B. Stafford, one of our former temporary patrolmen, back on for a short period. He started back on April 20th and worked until May 10th and during that time worked on some of the worst fires that have occurred in the district during the past fire season. Many times he has had to fight it out right on the fire break with these fires as the winds have continued to aggravate the situation here all season and fires coming off of unprotected tracts onto T. P. O. lands have given most trouble as they always have good headway burning with high winds and are very hard to put out.

Though wood exposed to the weather will last longer if painted, some woods withstand weather damage very well and will last a long time without paint. Among these, says the United States Forest Service, are white pine, yellow poplar, cypress, and cedar.

MOUNTAIN NURSERY HAS BEEN ESTABLISHED

New Undertaking Makes Favorable Start — Pump and Water System Installed.

The North Georgia Forest Nursery for the production of trees for reforestation by private land owners has been established on a site in Union county on the Appalachian Scenic Highway about ten miles from Neel Gap. This site is on land leased from the Georgia Mountain Agricultural Experiment Station.

A detailed survey including a topographic map has been made of the area. The seed beds have been constructed and seed planted. A pump and complete water system has been installed in order to supply a sprinkler system for the seed beds.

The following species of trees will be grown this year: Loblolly pine, white pine, shortleaf pine, tulip poplar, black locust, and black walnut. All of these species are suitable for planting in the mountain and Piedmont plateau regions of the state.

The seedlings may be secured by land owners at the approximate cost of production, and will be available for planting this fall and winter.

E. B. Stone, District Forester.

MOUNTAINS' WILD FLOWERS ATTRACT MANY VISITORS

May for Dogwood and Azalea—June for Kalmia and Rhododendron.

With the coming of spring in the mountains the dogwood and azalea are among the first shrubs to bloom. The dogwood was in full bloom, and the azalea attained full bloom shortly after the middle of May.

With the large number of varieties of azalea, ranging from the pure white to numerous shades of the flame, the woods took on a highly colorful appearance and offered an attraction well worth the attention of the motorist who plans to spend the day in the open.

During May many were attracted to the mountain region, and the Vogel State Park at Neel Gap was a center of interest. Within this area large masses of azalea were to be found; and the six miles of trails maintained by the Department of Forestry and Geological Development make the area easily accessible to those who wish to get off the main highway. The trail system, including the trail to the top of Blood Mountain, has recently been improved and is now in splendid condition, and the hiker will find it easy to travel back into the various points of interest.

The rhododendron and kalmia will not begin to bloom until about the time the azalea drops its blooms, so the mountains will be a mass of color for some time. In addition to the shrubs, a great variety of

smaller flowers are to be found, the number and varieties increasing with the coming of the summer months.

This region with its high peaks, water falls, and great variety of plant life is a very inviting one at this season of the year, and the motorist will find all of these attractions at their best in the Vogel State Park at Neel Gap in Union county.

E. B. Stone, District Forester.

LONGLEAF AND LIGHT ANNUAL BURNING

Light annual burning is a temptation to some timber owners, especially to those who have longleaf pine forests. What effect light burning has on the rate of growth is probably not taken into consideration by those who desire to do annual burning.

Dr. Austin Cary of the United States Forest Service, who has worked in the south for many years, has made studies along this line and gives the results in the Journal of Forestry of May 1932 under the title, "Some Relations of Fire to Longleaf Pine."

Dr. Cary found that with the most careful protective burning, fires checked height growth between 20 and 25 percent. He found summer fires much more damaging than fires in the dormant season, summer fires killing sizable trees and growth rate of survivors being heavily reduced, with the effect long persisting.

The effect of winter fires on longleaf pine he found varied widely with weather conditions and the amount of fuel on the forest floor. In some cases the growth rate does not seem to be checked at all.

He states that young longleaf trees up to the time they are at least 15 feet high may be burned hard enough in winter to check height growth for the following year to a half or third of the normal amount, and that more than once in all probability, and yet resume the normal rate of growth the second or third year.

Georgia Has No Public Domain

Among inquiries coming to the Department of Forestry and Geological Development are some seeking sites for homesteading. Georgia is among those states having no public domain for homesteading.

For this reason, Georgia has no state interest in the proposal of President Hoover that public lands be turned over to the states. Evidently not much desirable land for homesteading remains in any of the states, judged by opposition the states are offering to the proposed "gifts" of the nation to the states.

Forester Buys Protected Land

As an evidence of foresters' practising what they preach, W. G. Wallace, District Forester at Columbus, recently bought 100 acres of land on Pine Mountain in a Timber Protective Organization area. Mr. Wallace considers protected land worth more than unprotected land.

ANNUAL MEETING FORESTRY ASSOCIATION

Prominent Array of Speakers For Meeting at Rome, June 22-23—Exhibits, Forestry Demonstration and School Children Program Aside From General Program.

Rome, the place, June 22 and 23 the dates, for the eleventh annual session of the Georgia Forestry Association.

An array of speakers unsurpassed for the association program has been arranged. A treat is in store for the friends of forestry.

The Rome Chamber of Commerce is acting host for the city of Rome and a most cordial welcome and hospitality may be expected from this city of seven or more hills famed for hospitality.

Aside from the program given below, the association has arranged for an interesting and instructive exhibit showing how Georgia is going about the development of its greatest natural resources. A program of moving pictures and short, interesting talks is provided for children of school age. A demonstration in good forestry practice will be given by the Division of Forestry on the Berry Schools forest.

The regular program of the association will be held in the Forrest Hotel. The public is cordially invited to attend.

The program arranged by the association is as follows:

PROGRAM

Morning Session

June 22, 10:00 o'clock (Central Time)

Presiding—T. G. Woolford, President, Georgia Forestry Association.

Invocation—Rev. W. L. Collins.

Welcome—Wilson M. Hardy.

Response—T. G. Woolford.

1. "Forestry Is Paying Its Way"—Mr. Bonnell Stone, Oxford.

2. "Paper Research in Georgia"—Dr. Chas. H. Herty, New York City.

3. "The Department of Forestry and Geology"—Mr. J. M. Mallory, Savannah.

4. "The U. S. Timber Survey"—Capt. F. Eldredge, New Orleans, La.

Open Discussion.

1:00 P. M. Luncheon, Judge Ogden Persons, presiding.

Afternoon Session

2:30 P. M. (Central Time)

Presiding—W. T. Anderson, Macon.

5. "National Forests in Georgia"—Mr. G. Smith, Athens, Tenn.

6. "Forestry and Power"—Mr. W. H. Barnwell, Atlanta.

7. "Trees as an Inheritance to the Future Generation"—Mr. Jos. A. McCord, Sr., Atlanta.

Open Discussion.

Banquet—7:30 P. M.

Toastmaster—Mr. T. G. Woolford, Atlanta.

Addresses—Governor Richard Russell, Atlanta, and another to be selected.

SECOND DAY Morning Session 10:00 o'clock

Presiding—Mr. John A. Davis, Albany.

8. "Rosin and Turpentine and Their Products"—H. L. Kayton, Savannah.

9. "Vocational Forestry"—Mr. L. M. Sheffer, Athens.

10. "The Southern Forestry Congress"—Mr. J. S. Holmes, Raleigh, N. C.

1:15 P. M.—Business Luncheon

Presiding—Mr. T. G. Woolford.

Reports.

Election of Officers.

Adjournment.

Forestry meetings of Public Schools in charge of Mr. C. A. Whittle, Atlanta, and Mr. W. H. Foster, Rome.

Demonstrations in charge of Mr. B. M. Lufburrow, State Forester, Atlanta.

Exhibits in charge of Mr. J. M. Mallory, Chairman, Savannah.

Officers of the Association

T. G. Woolford, President, Atlanta; Mrs. M. E. Judd, 1st Vice-President, Dalton; Dr. W. M. Folks, 2nd Vice-President, Waycross; G. E. Reynolds, 3rd Vice-President, Albany; Jos. A. McCord, Sr., Treasurer, Atlanta; Bonnell Stone, Secretary, Oxford.

Executive Committee—C. B. Harman, Chairman, Atlanta; H. L. Kayton, Savannah; A. K. Sessions, Cogdell; John M. Graham, Rome; Col. R. E. Benedict, Brunswick; E. A. McCormick, Gainesville; Miss Emily Woodward, Vienna; J. A. Davis, Albany; B. C. Milner, East Point; Judge Ogden Persons, Forsyth; W. T. Anderson, Macon; W. H. Key, Monticello.

General Committee Chairmen—Farm Forestry, E. S. Center, Atlanta; Town Forests, Mrs. M. E. Judd, Dalton; Membership, Gordon E. Reynolds, Albany; Statistics, Clark Howell, Jr., Atlanta; Legislation, W. H. Key, Monticello; Cooperation, Jack Williams, Waycross; Publicity, John S. Cohen, Atlanta; Industrial, Alex K. Sessions, Cogdell; Markets, I. F. Eldredge, Fargo; Research, Dr. Chas. H. Herty, Savannah.

Local Committee—Jno. M. Graham, T. B. Owens, W. T. Watters, S. A. Marshall, G. E. Maddox.

Program Committee—Bonnell Stone, Oxford, Chairman; Mrs. M. E. Judd, Dalton; T. G. Woolford, Atlanta; J. M. Mallory, Savannah; Jack Williams, Waycross.

Seedling Prices Announced

The Division of Forestry announced the following prices for seedlings for planting this fall or next spring:

Slash pine	\$1.50	per thousand
Longleaf pine	1.50	" "
Loblolly pine	1.50	" "
Shortleaf pine	1.50	" "
White pine	1.50	" "
Yellow poplar	3.00	" "
Black walnut	3.00	" "
Black locust	2.00	" "

FOREST SERVICE SELECTS FIFTY PRIMITIVE AREAS

Fifty "primitive areas" already have been set aside in the national forests by the Forest Service, United States Department of Agriculture, to be preserved for their educational and recreational values. Most of these have been designated in the last twelve months.

California leads the list with eighteen of these areas. Colorado has nine, Montana, Oregon and Wyoming have four each, Washington has three, Utah and New Mexico have two each, and Idaho and Minnesota have one each.

The primitive areas are outstanding regions of wilderness type where through absence of improvements, only primitive living conditions are available.

In addition to the primitive areas, six experimental forests and eleven "natural areas" have been set aside within National forests. The natural areas are to be kept in virgin condition, representative, so far as possible, of the original primeval forests. Their use will be exclusively educational and scientific.

DEVICE HELPS FORECAST DANGER FROM FOREST FIRE

A simple hygrometer for showing the moisture content of the ground litter in the forest has been designed by the Forest Service, United States Department of Agriculture, to aid those guarding the forests from fire.

Thrust into the litter, or duff, on the ground under trees, this instrument gives accurate readings of the percentage of moisture in much less time than the old method of drying and weighing samples of duff. As the probability of fires starting and spreading rapidly is related directly to the moisture content of the forest ground litter, forest officers equipped with these instruments are able to forecast fire danger and call protective forces.

The duff hygrometer consists of a perforated brass rod a foot long, containing a strip of rattan attached to a hand on a dial. Rattan has a peculiar quality of elongating rapidly when exposed to moisture. The dial hand of the hygrometer, controlled by the lengthwise swelling of the rattan strip and by a tension spring, indicates the percentage of moisture.

In northern Idaho, where destructive fires occurred last summer, forest workers found that a duff hygrometer reading 25 per cent moisture content means that the duff will scarcely burn at all, while a reading of 10 per cent or less shows danger from high inflammability.

Go to the annual meeting of the Georgia Forestry Association at Rome, June 22-23. It will be well worthwhile.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's
Leading Minerals

Reported by THE DIVISION OF GEOLOGY

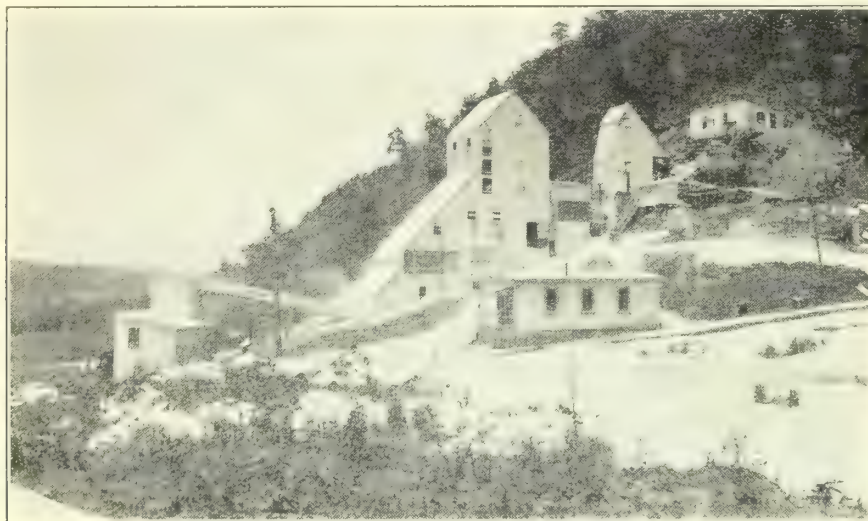
LIMESTONES OF GEORGIA

Article 4

The value of limestone output in Georgia varies from \$350,000 to \$650,000 annually. Commercial deposits are found in the Appalachian Valley region of northwest Georgia and the Coastal Plain of central and southern Georgia. In addition, the Piedmont Plateau contains a few scattered deposits of marble, which, besides being useful for building purposes, can be used for purposes to which limestone is put. The limestones of northwest Georgia are of marine origin and have been classed for convenience of description into five dis-

Perhaps no mineral is, in fact, used in so many ways nor more widely than limestone. At Whitestone in Gilmer county, a very white, somewhat dolomitic marble is crushed for use in terrazzo floors, in stucco, in cast stone, in road construction, as chicken grit and as a metallurgical flux; it is pulverized as a filler for asphalt and also as an agricultural limestone; it is used for dusting coal mines to prevent coal-dust explosions, as whitening, and by sulphuric acid manufacturers to neutralize certain products. This is also typical of uses of marble quarry waste in Pickens county.

The limestones of the southern part of



Grinding Plant at Whitestone, Gilmer County

tinct types; high calcium limestones, magnesian limestones, argillaceous limestones, dolomites, and high calcium or dolomitic marbles. Limestones vary in color from pure white to black.

The limestones of the Appalachian Valley region are semi-crystalline bedded deposits. They are found in the Shady limestone and Conasauga formations, the Knox dolomite, the Chickamauga formation and the Bangor formations. In the middle and southern part of the state the limestone occurs in Cretaceous and Tertiary formations.

Uses.—Limestone has a wide range of uses. Crushed limestone is used for road building and concrete construction, for ballast, building stones, mortars and plasters; agricultural purposes; in manufacturing cement; in making paper, leather, glue and soap; as a flux in blast furnaces; in copper smelting and glass manufacture. In the chemical industry calcium of limestone is used in making sodium carbonate, sodium chloride, calcium carbide, cyanamid, calcium nitrate, carbonic acid gas, gypsum, etc.

the state are used largely for road material. The Ocala limestone is spread on a road and compacted by scraping and rolling to form a layer 8 inches thick. Tar is then sprayed on and allowed to penetrate, followed by a top surface of asphalt and finely crushed rock. The result is an economical road of excellent quality, and with proper maintenance, of long life. A surface dressing is required about once in three years.

Georgia limestones are widely used for agricultural purposes and are particularly helpful in growing legumes such as alfalfa, clovers, soy beans, etc. Magnesium limestone has been found by the Georgia Experiment Station to be profitable for cotton on Piedmont soils. This form of limestone also prevents a disease of tobacco known as "sand drown."

APPALACHIAN COUNCIL MEETS

The Appalachian Council having in charge the general direction of the Appalachian Forestry Experiment Station with headquarters at Asheville, will hold its annual meeting at Asheville June 17 and 18.

GEORGIA LEADS IN ASBESTOS FULLERS' EARTH AND OCHRE

Assistant State Geologist, Richard W. Smith, Contributes Article on Non-Metallic Products of Georgia to "Pit and Quarry."

The leading article in "Pit and Quarry" for May is contributed by Assistant State Geologist of Georgia, Richard W. Smith. He brings to the mining world an ably written and well illustrated article dealing with the mineral resources of the state. He shows that Georgia leads all states in asbestos and fullers' earth. Nonmetallic producers account for nearly 95 percent of annual value of Georgia's mineral output.

Mr. Smith states that Georgia annually produces mineral resources to the value of \$15,000,000 to \$17,000,000. Georgia ranks first among the states in the production of asbestos, fullers' earth and ochre; second in the production of barite and raw clay and varies between third and fourth place in the production of marble. Of many of the minerals, the undeveloped reserves for the future are enormous and the production of the future will be limited only by the market and the progressiveness of the producer. For example, the sedimentary kaolins of Georgia are just beginning to be fully known to the consumer, and the production has shown a steady increase.

Descriptions are given of asbestos, barite, cement, clay, fullers' earth, granite, limestone, marble, mica, ochre, sand and gravel, talc and soapstone and tripoli. Eighteen illustrations accompany the article. The article will do much to bring Georgia's mineral resources to those who are interested in developing such resources.

FORESTRY RALLY—Continued

A motorcade of twelve cars went to the James Fowler lands where he has planted 1750 acres since 1926. The crowd was shown a slash pine that had grown eight inches in diameter and 30 feet in height in six years. Plans were made to exhibit one of these rapid growing trees at the annual meeting of the Georgia Forestry Association at Rome on June 22 and 23.

A visit was made to the Neill and James Gillis lands to study effects of firebreaks and the progress of plantings which have been made.

It was a great day for the cause of forestry in Treutlen county.

A. L. Brogden, vice president of the Turpentine and Rosin Factors, and Carl H. Speh, secretary-manager of the Pine Institute of America, will represent American naval stores interests at the International Naval Stores Confere at Bordeaux, France.

Visit Georgia parks at Neel Gap and Indian Springs.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 2

ATLANTA, GA., JULY, 1932

No. 7

DISTRICT LEADERS IN SCHOOL FORESTRY WORK

Inspiring Achievements of Agricultural Vocational Teachers in Schools and Communities Indicate Great Possibilities in the Interest of Forestry.

R. O. Parker, teacher of Vocational Agriculture of Franklin County High School, Carnesville, has done outstanding forestry work in the Fourth Forestry District, consisting of 20 counties with more vocational schools than any district in the state. Second in rank in the district is Eastanollee High School in Stephens county, with W. L. Green teacher. The district forester of this district is C. N. Elliott, Augusta.

Mr. Parker and his students planted 12,000 pine seedlings in the spring of 1932. Aside from planting vacant spaces in the school forest, the services of students were offered for planting areas of land owners, provided they purchased the seedlings. This service was offered the community as an incentive to reforestation. The response was gratifying and 12,000 young pines are now growing on formerly idle and unprofitable land.

Of the 46 students taking forestry work at this school, 37 had home projects in which they constructed firebreaks, planted seedlings, thinned and improved their forests.

One of the enterprises of the school that showed interest and cooperation of a high degree was the erection of a log cabin as a clubhouse on the school forest. The logs and lumber were brought to the school by the students who did all the construction work and had plenty of fun in doing it. The main building is 20 by 25 feet. The opening of the clubhouse was celebrated by a father and son banquet attended by more than 200 people.

Two forestry meetings were held for parents during the school year, with an average attendance of 34. Several articles about forestry activities were placed in local newspapers. Talks were made to the men's clubs on planting trees and shrubs. Assistance was given in planting a town park area to trees and shrubs. Some work has been done toward making a swimming pool on the school forest. This school has

won forestry camp scholarships for two succeeding years. A forestry fire consciousness has been so well developed that very few fires have been allowed to break out in the area of several miles radius around Carnesville.

Commerce High School

In the second forestry district of which Everett B. Stone, Jr., is district forester at Gainesville, a district covering counties of northeast Georgia, the teacher reported as doing the most outstanding work is C. L. Veatch of Commerce High School. Professor Veatch won the Georgia Forestry Association prize for the school years 1928-29 for the best forestry work for the state. He had 20 students doing forestry work, of which 14 have home projects.

This school has a forest seed bed 150 by 4 feet; 3 beds 6 by 12 feet in which both pines and hardwoods are grown. Each student has been required to identify 40 species of trees, mount the leaves and describe the trees. A case has been made in which the seed of 40 species are displayed for student study. The students under the direction of Prof. Veatch have constructed a number of hypsometers and calipers for

(Continued on Page 2, Column 1)



Forestry Cabin and "Crows Nest," Georgia Industrial College, Barnesville

IMPROVED METHODS ROSIN MANUFACTURE DEVELOPED

Department of Forestry and Geological Development Has Part in Undertaking—Higher Grade Products Indicated.

The Department of Forestry and Geological Development has been instrumental in inaugurating experiments at Cogdell, Ga., in improved methods of rosin manufacture in which the Forest Products Laboratory of the United States Forest Service and the Bureau of Chemistry and Soils of the United States Department of Agriculture are cooperating.

Representatives of the federal cooperating agencies, with the cooperation of the Timber Products Company and Better Rosin Corporation, investigated the application on a commercial scale of a process for the removal of the water soluble components of turpentine gum and the production of rosins of higher grades.

Results of experiments indicate the practicability of the process. Important studies were made of the apparatus and methods, resulting in suggestions for perfecting the process. Materials have been taken from Cogdell by federal workers for further studies in their laboratories.

While the new process is still in progress of development, the facilities placed at the disposal of the research workers by the Department of Forestry and Geological Development, have expedited the work very greatly and federal investigators report that a great deal of valuable progress has been made at Cogdell.

NAVAL STORES YEAR BOOK

The Naval Stores Review, Savannah, Ga., announced during June the issuance of the "Year Book" for the fiscal year 1932-1933. It gives valuable data of international scope on naval stores production, consumption and trend of prices. It also presents surveys of conditions in the United States. No publication is more valuable to the naval stores industry than this, and anyone who desires to be well informed about this great industry should have this year book.

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C. A. WHITTLE, Editor.

Bonnell Stone, Oxford, Development Agent
Mrs. Nellie Nix Edwards, Treasurer, Atlanta

Forestry Division

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E. B. Stone, Jr., District Forester,
.....Gainesville
H. M. Sebring, District Forester.....Macon
C. B. Beale, District Forester.....Waycross
W. D. Young, District Forester.....Rome
Jack Thurmond, District Forester,
.....Savannah

E. N. Elliott, District Forester.....Augusta
H. D. Story, Jr., District Forester.....Albany
W. G. Wallace, District Forester.....Columbus
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Bruce Suttle.....Plant Engineer
W. T. Allen.....Chemist
J. B. Osborne.....Plant Assistant

use in measuring the volume of standing trees. Moving pictures on forestry have been obtained and displayed to 450 people by Prof. Veatch.

An outstanding work, revealing a high degree of initiative is a community enterprise designated "Commerce Improvement and Protective Association." The plan which he has worked out is regarded as having possibilities of wide adaptation to areas of many farms and scattered forest lands. In brief, the plan is a cooperative effort of land owners to report fires and help each other to fight fires and to carry on reforestation and forest management according to good practices.

In two days 18,981 acres were listed in this organization by 23 land owners. His intention is to have the organization operate over a 10-mile radius from Commerce.

This school has featured planting black locust especially for growing fence posts. Yellow poplar and pines are also grown in the seed bed and planted on boys' home forestry projects, and aid has been given farmers in planting.

Some harvesting has been done on the school forest and on forest land managed by the school, some of the returns going to the school.

Soperton High School

In the district covered by Jack Thurmond, Savannah, the Soperton High School ranks first. R. D. Pulliam is the agricultural vocational teacher directing the school forestry project. Not only has the school forestry program been carried out, but Prof. Pulliam has been instrumental in hav-

ing the primary facts about forestry introduced into every school in the county. A forestry cabin has been constructed by the school at the dedication of which a forestry rally was held, prominent speakers heard, and a barbecue served. About 300 people attended, and after the addresses several thousand additional acres were signed up for the Treutlen County Timber Protective Organization. Following the rally, a motorcade was conducted to the Fowler and Gillis plantations to observe the success of extensive tree plantings; also to observe the firebreaks and protective measures of the Treutlen County Timber Protective Organization.

In this school 20 students have taken the full work in forestry and 9 have home projects, one student planting nearly 3,000 seedlings. On the school forest 5,000 seedling slash pines have been planted. A forest seed bed is maintained. Assistance has

age attendance of 39, at which forestry subjects were discussed.

Of the 39 boys studying forestry, 31 had home projects in forestry. A seed bed has been maintained and several thousand seedlings have been planted by students and farmers, supplied from the seed bed.

A father and son banquet was held at which forestry was presented. A number of students have conducted pruning as well as thinning on their home forest projects. A thousand acres were thinned and pruned under the direction of Mr. Bates. Pruning of pines consists of removing lower branches. A ten-year program of forest management was made for a timber owner by Mr. Bates, who also has aided farmers in negotiating proper turpentine leases. The school grounds of four schools in the county have been planted and beautified under the direction of Mr. Bates. In presenting the work of forestry to his students, he has de-



School Cabin and Visitors at Opening Day in School Forest at Soperton

been rendered in tree and shrub planting on the grounds of three other schools in the county; also, court house grounds and city cemetery. Boys of the school have helped to fight fire at every opportunity and fire protective sentiment, already strong in the county, has been increased by the school during the year. The teacher has conducted night classes for adults, three of which meetings have been in the interest of forestry and attended by 150 people.

The county commissioners recently felt that funds for vocational agriculture or for county policeman would have to be cut off. The commissioners decided in favor of the agricultural teacher.

Nashville High School

In the forestry district in charge of C. Bernard Beale, Waycross, the school reported as leading in forestry work is at Nashville. W. B. Bates, agricultural vocational teacher, has directed the work and for the school year 1929-30 won the Georgia Forestry Association prize for doing the best work in the state. Mr. Bates has stirred up not only a great deal of interest among his students, but among the timberland owners whom he has assisted with advice about fire protection and thinning. He held 10 meetings of adults with an aver-

veloped a course calendar and job analysis that has met with approval.

Moultrie High School

In the eighth district of the Division of Forestry with H. D. Story, Jr. in charge at Albany, the school to rank first in forestry work is the Moultrie High School, with W. T. Walters as agricultural vocational teacher. This school as many other central consolidated schools, draws high school pupils from various parts of the county. Twenty-four high school students took the forestry work. Of these twelve had home forestry projects.

One of the outstanding achievements of the school this year has been the construction of a log cabin on the school forest. The logs were brought to the school forest by students after being taken out as thinnings from their home forestry projects. The students did all the work except the construction of the chimney. On June 2 the boys had open house. Speeches were made and refreshments were served. A good deal of publicity was obtained and the boys were made to feel proud of their achievements and of their work in forestry.

This school has had splendid success with its seed bed. An excellent stand of seedlings in a bed 4 by 40 feet promises to provide thousands of seedlings for students

use on home projects and on their fathers' farms. Longleaf and slash pine are grown.

The school has had excellent success with tree seedlings in planting open spaces in the school forests. Its sample plots for studying the effect of burning are in a separate tract from the main school forest. Here the influence of annual fire has shown marked difference in only two years. The influence of forestry work in Colquitt county is being felt widely and favorably. Local civic organizations are backing Prof. Walters in his forestry program.

Georgia Industrial College

The school in the fourth district, with W. G. Wallace, district forester at Columbus, is Georgia Industrial College at Macon. F. B. White is the agricultural vocational teacher. Prof. White has been runner-up for the Georgia Forestry Association prize for two years. In spite of the fact that most of his students are boarders and come from various parts of the state, 11 of the 16 students in forestry have home projects which they have established and conducted during holidays at home. This school has a splendid forest of about 30 acres. Fuel and wood supplies for the college are supplied from the forest. Last year 150 cords were cut by the students under the direction of Mr. White, who has used excellent judgment in thinning and improvement cutting to promote yield.

A seed bed has been established and a supply of water for the seed bed is being provided by the installation of a pump, pipe line and reservoir, all this work being done by the students.

A very attractive log cabin has been built, constructed by the boys except the one chimney. The building has a front and back porch supported and bannistered with river birch; it has a kitchen, and inside are rustic seats and furniture made by the boys. A picnic ground has been laid out with tables and seats. White stone paths and driveways. A road has been built to the cabin and through the forest. At this cabin the forestry club meets. Mr. White was the first to organize a forestry club with degrees given for each step in required forestry work. The forest and cabin are in great demand by the community which finds them an ideal place for outings.

An interesting and attractive feature is a "crow's nest" or lookout tower constructed in the top of a tall pine with a ladder constructed up the tree.

All the forestry management plans are carried out as outlined by the Division of Forestry.

In the vocational building Prof. White has a splendid forestry exhibit and materials for teaching forestry. Each student is required to mount leaves of 40 species and describe the same. Wood samples, tree seeds, photographs, charts

and samples of veneer, cellophane and other products are displayed. Samples of injury by tree disease and insects are on display. Numerous signs made by the students are displayed on the forest, all excellently made.

Lanier High School

Lanier High School, located at Macon and drawing students from all parts of Bibb county, is reported as being first in the Fifth District of which H. M. Sebring is district forester with headquarters at Macon. W. H. Sorrells is teacher of vocational agriculture. All rural students and some city students receive instruction in forestry. Five rural students have home forestry projects, averaging 5 acres each.

The school forest consists of 20 acres involving a number of problems of forest management, among them deep erosion on the fall line between the Piedmont Plateau and the Coastal Plain. The school has planted 1500 slash and longleaf pines. Firebreaks have been constructed as called for by the forest management plans. Tree seed were collected and a seed bed planted. On the sample quarter-acre plots trees have been tagged and annual diameter measurements are recorded to note the effect of fire on the rate of growth, one tract being burned over each year and a comparable plot alongside left unburned.

Students of the school have collected fire statistics of their respective communities, giving names of land owners, acres burned over and causes of fires. Boys who have received instruction in forestry are spreading the gospel of fire protection, aiding in fire fighting and leading the way in reforestation and forest management in their respective communities.

Dawnville High School

In the district of which W. D. Young, of Rome, is district forester, Dawnville High School, near Dalton, is first and the Fourth District A & M School at Carrollton, second. Ivan E. Carson is teacher at Dawnville and has had only two years of forestry in this school. Thirty students took forestry work, and of this number, twelve had home projects.

The school forest management plans are carried out. Sample plots, burned and unburned, have been established, trees numbered and growth records kept. Firebreaks have been constructed, tree seed collected and a forest fire survey of the school community has been made.

Community interest in forestry has been quickened by the activity of the school and students.

GENETICS OF FOREST TREES

Comparatively little has been done to breed superior trees. A vast amount of work has been on field and horticultural crops with phenomenal results. Some studies are being inaugurated along this

EROSION NATIONAL PROBLEM

At the annual meeting of the National Forestry Association, Secretary of Agriculture Hyde spoke on "The Cost and Cure of Erosion." Among his notable statements was the following:

"Erosion strikes at the vitals of civilization. It is the problem of the farmer, the fisherman, the builder of waterways and reservoirs, the business man, the legislator—the problem, in short, of every thinking citizen of the nation. In part an individual problem for the farmer, it is also in large part a problem for community, state and national action. In the permanent improvement of waterways and water supply, in the conservation of soil resources, in our attempts to achieve a balanced agricultural production and to maintain an industrial civilization, efforts must begin on the land.

"A wise land-use program lies at the base of many of our problems—social, political and economic."

HARDWOOD FIRE WOUNDS

R. M. Nelson and I. H. Sims of the Appalachian Forest Experiment Station measured the bark discoloration left by fire on hardwood trees at McFalls Creek, Virginia, on different species of trees averaging 4 to 28 inches in diameter, and then estimated the wounds left in the inner bark. Yellow poplar showed the smallest wounds and scarlet oak the greatest.

In the case of trees of 10 inches in diameter at 4½ feet from the ground, 5 square feet of discoloration on the surface leaves a wound 1½ square feet on yellow poplar, 3 square feet on chestnut, 4 square feet on white oak and 7½ square feet on scarlet oak.

T. P. O. Acreage Budgeted for Fire Protection Fiscal Year 1932-33

Budgets have been prepared on approximately 800,000 acres of T. P. O. lands in the seventh district for next fiscal year. The budgets indicated that many landowners are increasing their expenditures for next year. There was a general trend to intensify their pre-suppression work, particularly in increasing the mileage of fire breaks. More pre-suppression work than ever before is scheduled which, with normal weather conditions next year, should show a vast improvement in the fire record for next season on the T. P. O. acreage.

line in a cooperative project of the Division of Forest Service and the Georgia Experiment Station at the Mountain Station in Union county.

A recent announcement comes from California to the effect that the Institute of Forest Genetics has been established by funds provided by James G. Eddy of Seattle, Washington. The work has been inaugurated at Placerville, California. By selections and crosses it is hoped that trees may be made to grow more rapidly.

Georgia Forestry Association's Very Constructive Program at Rome

Discoveries of Great Importance to Georgia's Development of Forestry Resources Announced — Governor Favors Severance Tax — Association Favors Timber and Water Survey and More Parks — Exhibits of Trees Showing Very Rapid Growth and New Methods of Utilizing Forest Products and Forestry Activities.

The tenth annual meeting of the Georgia Forestry Association, held at Rome, June 22 and 23, is regarded as the most important in many respects ever held. Among the most significant statements at the association meeting was the announcement of Dr. Chas. H. Herty that second growth loblolly and longleaf pines are as well adapted to white paper manufacture as slash pine about which he had already made announcement.

Governor Russell declared in favor of deferred or severance tax, collectable as forestry products are harvested, as an important incentive to forestry development in the state.

The association urged steps to cooperate with federal agencies in having a complete timber survey made of Georgia, a complete survey of streams, and asked for more state parks.

A slash pine tree planted in a plantation of James A. Fowler, six years ago, now 8 inches in diameter and 24 feet high, was transported from Soperton and set up as an exhibit. This with other exhibits comprised the most successful exhibits ever made at an association meeting.

T. G. Woolford, Atlanta leader, was continued as president; Bonnell Stone, Oxford, "Father of Forestry in Georgia" as secretary; C. B. Harman, pioneer in forestry work, as chairman of the Executive Committee. Other officials are given in the course of this account.

The next meeting place is at Savannah during the celebration of the 200th anniversary of the founding of Georgia at that city.

OPENING SESSION

Invocation was offered by Rev. W. L. Collins of Rome. In the absence of Wilson M. Hardy, President of the Rome Chamber of Commerce, who was scheduled to make the welcome address, J. B. Sullivan, Mayor of Rome, extended a hearty and cordial welcome, to which President T. G. Woolford responded with appreciation, and with expressions of love for Rome.

Bonnell Stone speaks

Introduced as a young man who dreamed forestry and made his dreams come true, Bonnell Stone, Oxford, Georgia, presented a paper on "Forestry Pays Its Way". Mr. Stone made it clear that Georgia is getting great returns from its investment. Instead of forests being exhausted, as predicted a few years ago, he pointed out that forest products are on the increase in recent years. The Herty cupping method of turpentine new to be followed, as he believed, by a Herty method of paper making from southern pines, have added to and promise to add to the value of Georgia forests.

He told of the necessity of insuring the woods against fire as fundamental to making forests pay. How the Division of Forest Service has developed the Timber Protective Organization system in Georgia, and of great results showing that fire anywhere and under any condition can be controlled, he pointed to as a solution of the fire problem. Fire protection, he said,

saved vast sums of wealth each year with little outlay.

He referred to the forestry work in agricultural vocational schools as providing leaven that will work out for great development of forest wealth of the state, and vast returns from little expenditure. Prizes offered teachers, schools and pupils by the Georgia Forestry Association and Dr. Herty are gilt edge investments in promoting the development of forest wealth. For every dollar the state has invested in the paper research plant, two dollars have already come into the state, which is nothing to compare with the great returns expected from the knowledge of ways of converting our forests into wealth.

Parks, as a tonic to health, inspiration and bodily fitness to produce more wealth, he said, was an investment of great value.

Mr. Stone plead for the encouragement of growing forest crops by the use of deferred or severance tax collectible as forests are harvested. By this means the land owner may be able to hold and profit by growing trees, which otherwise would be lost through the present system of land taxation.

In the course of his address Mr. Stone sketched in an interesting manner the development of forestry in Georgia and of how well the organizations set to this task are accounting for their stewardship.

Address of Mr. Mallory

Speaking on the subject, "Department of Forestry and Geological Development", J. M. Mallory, Savannah, member of the Commission of that department, and Industrial Agent for the Central of Georgia Railway Company, said:

"The Department of Forestry and Geological Development was created by the last General Assembly of Georgia in response to the demand for economy in State Government. Of the proposals suggested, the combination of forestry and geology was a logical and happy outcome. There was added the Division of Paper and Pulp Research, which deals with both forest and mineral products.

"Supplementing these divisions, we have at the General office the development agent, Mr. Bonnell Stone, whose duties are to coordinate the work of the divisions, promote markets for forest and mineral products, cooperate in the preparation of industrial surveys and give general supervision to park activities. Then we have our educational manager, Mr. C. A. Whittle, who plans and supervises the forestry co-operative work with vocational schools and edits the monthly publication of the department, "THE FORESTRY-GEOLOGICAL REVIEW".

"All of these activities are under the supervision of a commission of which Governor Russell is chairman, and is composed of five citizens from different sections of the state."

Mr. Mallory told of the "come back" of the lumber and naval stores industries with second growth pines, and of the hope for pulp and paper mills to come as a result of research work of Dr. Herty. Paper mills

of this country, he said, consume half a million tons of kaolin annually and 375,000 barrels of rosin, and 350 to 400 thousand tons of lime, all of which raw materials are found in abundance in Georgia. Besides, Georgia has abundant water, fuel, transportation and labor to meet paper mill requirements.

Speaking of the Geological Survey, Mr. Mallory told of mineral and commercial water surveys and of the close tie-in of Geology with paper making in kaolins; how Georgia is rich in mineral resources; of the 45 bulletins and reports of the Geological Survey, adding that there is much to be done, which for lack of funds, has not been done. He referred to valuable work in ceramics carried on by the Georgia School of Technology. Plans for placing mineralogical exhibits in schools, he reported, was being considered by the Department of Forestry and Geological Development.

The establishment of forest nurseries, to grow millions of seedlings for sale to Georgians at cost, he referred to as a new activity of the department.

Increasing the number of state parks, he said, is contemplated and studies of improved methods of turpentine production at Cogdell are in progress.

The gratitude of every citizen of Georgia, he said, is due Francis P. Garvin, The Chemical Foundation, Mrs. E. T. Comer of Savannah, and the Savannah Electric and Power Company for their generosity in providing equipment and a building for the paper research plant at Savannah, and to concessions of equipment manufacturers, in all of which we was not unmindful of the important link of the able and genial Director of Research.

Forestry and Power

W. H. Barnwell, Atlanta, connected with the Georgia Power Company, gave an interesting and instructive discussion of the part forests play in conserving water power, thereby contributing to the maintenance and development of this great natural resource of Georgia.

The potential water power of Georgia, he said, is 744,000 horse power, less than half of which has been developed, but perhaps 50 per cent of the undeveloped water power may never be developed for various reasons. Maintenance of forests and preservation of water power, he said, was conserving assets of lumber and water power amounting to an annual value to Georgia of \$90,000,000. The reason forests are essential to water power, he said, is that the forest floor makes a sponge for holding water to soak into the soil, which finds its way to springs and issues forth as clear water throughout the year.

He said about 12 inches of rainfall are evaporated by the trees themselves and 6 to 12 inches of rainfall are evaporated from the soil surface, leaving the remainder to percolate into the soil if forests have remained unburned and their floor litter is there to absorb it. Instances are reported of springs decreasing their flow and going dry with the clearing off of forests.

He compared a tin roof to a roof with a sponge on it as an illustration. From the tin roof the water runs off rapidly; on the roof with a sponge the water is stored and drips out slowly.

The effect of deforestation of the Chatahoochee River basin area and the increase of silt and debris which resulted in completely filling up the waterhead of the dam so that the only available water power is the regular flow of the stream, was cited. He called attention to the deforested area around Copper Hill, of the ghastly erosion and rush of silt and gravel into streams and

a striking illustration of what vegetation does in protecting soil.

Luncheon Program

At the luncheon on June 21, the toastmaster was Judge Ogden Persons of Forsyth, who wittily and pertinently commented as he introduced Mr. George Butler, President of the Savannah Chamber of Commerce, who spoke of the plans of Savannah to celebrate the 200th anniversary of the founding of Georgia next year. He was followed by Warner Hall, Decatur, President of the Georgia division of the Appalachian Trail Association, and enthused the audience over the pleasures of hiking over the wilderness crests of the Appalachians.

Secretary J. W. Foster of the Rome Chamber of Commerce, was called upon. He asked every delegate to make his or her wishes known. A delightful musical program was given at the luncheon.

National Forests in Georgia

Clinton G. Smith, supervisor of National Forests in Southern Appalachians with headquarters at Athens, Tenn., spoke on the National Forests in Georgia, the Cherokee and Nantahala forests. At present he said, only about 50 per cent of 340,000 acres originally planned for Georgia, has been purchased. The average price paid for mountain lands has been \$5.40 per acre. No land has ever been condemned in acquiring the forests.

In the Georgia part of the National Forest are a great variety of trees, growing on rich soil under maximum rain fall, resulting in splendid and varied forest development.

Mr. Smith said roads and trails have been opened up for 262 miles on the Cherokee and about an equal amount on the Nantahala forests, thus opening up remote isolated regions for those dwelling in the mountains and for the access of the public into these picturesque mountain areas.

The national forest has a game refuge operated in cooperation with the state and is increasing the wild life in the mountains out, he said, there should be five or six such refuges to thoroughly replenish the mountains with deer, wild turkeys, etc.

Vacationists, he said, are welcomed to the national forest areas with their lakes, trout streams and for the hikers is the Georgia section of the Appalachian trail, extending largely through the national forests. The national forests contribute to the water sheds, this being one of the original purposes of the national forest in Georgia.

Mr. Smith invited Georgians to visit and enjoy the recreational advantages of the national forests.

Trees as an Inheritance

Joseph A. McCord, Atlanta, delighted the audience with his witty sayings, sound advice, and with his suggestion for using trees as an inheritance for one's children. He said the industrial age had over-reached itself and that the trend is now away from industrial centers back to the farm where subsistence is easier to obtain. This he said, would bring back agriculture to its rightful place. The farm region which fails to grow its own food crops will lose its population, he said. In his trips over the state he had found agriculture shifting to a live-at-home basis.

On fewer acres, with better methods, as much can now be grown on 5 acres as was formerly grown on 25 acres. Lands now eroded and not needed for agricultural crops should be set to growing trees. Erosion hillsides planted to trees will reclaim the lost bottom lands.

Mr. McCord said the present generation is leaving an inheritance of \$450 for each man, woman and child in this country to

pay, and asked what provisions are being made to leave the children an asset rather than a liability.

His suggestion was that forests be left as an inheritance, an inheritance growing as the trees grow. This inheritance he would protect by leaving the forest as a trust with a trust company or trust officer, so as to keep the inheritor from recklessly dissipating it. He would collect only a severance tax when tree products are harvested.

The trees he would grow as an inheritance might be walnuts, black locusts, persimmons or pines or whatever other species might be adapted to any given region.

Dr. Herty Address

Dr. Charles H. Herty of Savannah and New York, and research chemist in charge of wood pulp and paper manufacture of the Department of Forestry and Geological Development of Georgia, concluded the first day's program with an address that held his audience with intense interest. He made the momentous announcement that he was ready to say from his research work that loblolly and longleaf pines are as well suited to the manufacture of white news print as slash pine about which he had already made announcement.

Instead of the manufacture of white news print being a South Georgia possibility it has become a state wide possibility, and he felt confident that short leaf and Virginia pines would be found adapted to paper pulp as well as those tried out.

Samples of beautiful white pulp made in exactly the same way from slash, longleaf and loblolly, at the Savannah research plant were displayed by Dr. Herty. On a screen were shown photographs of fiber magnified by microscope showing little differences between the three leading tree species. The length of the fiber of the three species was shown to be practically the same.

Paper, Dr. Herty said, had not yet been made and would not be made until the series of experiments with wood pulp have been concluded. He spoke of a few of the problems to be solved.

Lantern slides of photographs made of the research plant at Savannah, were displayed and explained by Dr. Herty. Dr. Herty said that he had intended to make an announcement of his recent discoveries about the adaptability of loblolly and longleaf pines to paper pulp manufacture, first at the meeting of the Georgia Forestry Association, only to find that a news agency had disregarded the release date and published it before the meeting, much to his regret.

Dr. Herty's address was heard with intense interest and ended with an ovation of applause in his favor.

Governor Russell and Mrs. Harris Heard

The banquet program at night was featured by addresses by Mrs. Corra Harris and Governor Richard Russell, also by a musical program. The toastmaster who reveled in wit, humor and poetry, was President T. G. Woolford of the Association.

Mrs. Corra Harris, noted writer, living in the country in an adjoining county, in her quiet but very impressive manner, swayed her audience with brilliant sorties of wit and with her expressions of love for trees. She told of her daily association with trees, of their intimate and beautiful relation with the horizon of her country life. She cherished trees; they are so much a part of her life that she cannot consent to cut them down. She ministers to them when ill and would conserve and perpetuate them.

The fear of fire among her trees was

ever present during the fire season and the odor of burning woods was a signal of alarm, of an impending danger. She spoke of a six-mile threat of the enemy fire against her beloved woods, of the feeling of helplessness, of a need of aid from the forestry association and the state forest service.

She knew of no better way to curb fires at their source than to educate the people to the meaning of fires. She wanted school talks, talks on store steps, close contact with everyone by foresters, that the people might have fire consciousness.

Introduced with a toast of pure water by President T. G. Woolford, the chief executive of the state, Governor Russell, Chairman of the Commission of Forestry and Geological Development, was given an ovation.

Governor Russell said he would not, if he could, undertake to eulogize the woods after hearing Mrs. Harris, nor would he, if he could, undertake to discourse on technical forestry before a body of forestry experts. He would, however, venture to say that this country had been very profligate with its forestry resources, that it failed to profit by the experiences of older countries and now must face about and reclaim lost ground.

Under the necessity of retrenchment in state operating expenses, the General Assembly, he said, had found it necessary to cut down the cost of state departments, but with an appreciation of the need for forestry work, the legislature had singled out the forestry department for a slight increase.

The Governor said that in recent years agriculture in the south had been forced back into a live-at-home program. More intensive methods are now making more on fewer acres. This, with the exodus of farm labor with the incoming of the boll weevil, had left the state with much unused farm lands, now useful only for growing trees, and reforesting these idle lands will prove a genuine blessing.

He spoke of the work of Dr. Herty as holding out great promise for timber growing in Georgia, introducing an important new demand for forest crops.

Speaking of forest fires, he said he had observed their devastation particularly in South Georgia; he had seen the soil of swamps burned during the recent drouth, and he knew that the fire is the chief problem of forestry in Georgia. He said that the Department of Forestry and Geological Development with a force of a state forester and eight district foresters could not, of course, undertake to fight everybody's forest fires, or to visit every school, or sit on the store steps with groups of men and talk about forest fires. More of that kind of service it is hoped can be rendered some day. He was certain, however, that the few foresters in the state have been of great help and that the fire devastation would have been vastly greater had they not been in the field encouraging and organizing landowners to fight their own fires.

The work now being done by the Department of Forestry and Geological Development, through the vocational agricultural schools is having far-reaching influence in building up forestry sentiment in the state.

Governor Russell came out in a strong declaration in favor of deferred or severance tax on forest land, collectable when products are taken from the forest land, rather than a land tax as at present. Such legislation requires a two-thirds vote of the General Assembly. Hitherto it has failed of enactment. He believed no step would encourage forest development more than this change of tax policy.

In conclusion, Governor Russell said he could assure every one that forestry is not a stepchild of the governor of the state.

Vocational Forestry in Georgia

Professor L. M. Sheffer, state supervisor of agricultural teaching, spoke of the forestry project in the vocational agricultural schools of the state. This project, he stated, originated in the Georgia Forest Service which presented a plan of co-operation to the vocational agricultural department which was very glad to co-operate in carrying on this plan. Georgia is the first state to undertake this forestry project in vocational schools. All of the white Smith-Hughes consolidated rural high schools in the state have school forests of ten or more acres on which the practice of forestry is carried on under management plans made by the Georgia Forest Service and with the aid of district foresters who visit each school two or more times a year.

In addition, boys have home projects on their fathers' forests where they plant trees, thin and construct firebreaks, each of these being a neighborhood demonstration.

The rudiments of forestry, practical things that can be applied on any farm, are taught by the job method. These jobs are collecting seed, operating seed beds, tree planting, thinning, estimating the value of standing timber, use of woods and names of trees.

Professor Sheffer spoke his gratitude to the Georgia Forestry Association and to Dr. Charles H. Herty for prizes offered teachers and pupils doing the best work on forestry. These, he said, were proving valuable incentives.

The forest camp, provided by the state forest service, he said, was also proving a great incentive as well as a school of training in practical forestry.

Professor Sheffer gave reports from rural schools showing the kind and extent of work in forestry and of community interest aroused.

State Forester Holmes of North Carolina

State Forester J. S. Holmes of North Carolina addressed the meeting concerning the aims of the Southern Forestry Conference, the organization that was instrumental in forming the Georgia Forestry Association.

Mr. Holmes gave a history and objectives of the conference, told of its accomplishments and advanced many reasons for believing that this south-wide organization should continue to function. He thought that at the present time of business depression it would be difficult to revive the conference but believed that a good time and place to reorganize would be at one of the state forestry association meetings.

Mr. Holmes said there were many south-wide problems in forestry such as taxation, state and national, of south-wide movements of forest surveys represented by the work of Captain I. F. Eldredge, and promotion of south-wide practices of lumbering and naval stores policies that a south-wide organization could carry out better than by any other way.

What Forest Survey Means to Georgia

Capt. I. F. Eldredge, formerly of Fargo, Georgia, now with the federal forest survey with headquarters at New Orleans, gave an interesting account of plans for making a forest survey in the south.

"The Forest Survey of the South", he said, "is aiming at an accurate picture of the forest situation in the southern states without reference to hitherto published figures, forecasts, or theories, private or public."

For each state, information as to percentage of forest land under virgin growth, second-growth, and cut-over and not restocking; the area and percentage of agricultural land under cultivation and abandoned; area and percentage of forest types; stand of merchantable timber in board feet by species and log grades; where appropriate, the number and grades of poles and piling; the number of cords of pulpwood and of retort wood.

In the naval stores belt the number of crops of turpentine cups now in operation, kind of cups being used, percentage of crops of various stages of working, supply of available turpentine timber on hand, and a forecast of available timber for each of two following decades.

A study is to be made for all forest types of the regrowth conditions on cut-over or burned-over land; the rate of growth on both old and young stands; rate of depletion by cutting, turpentine and by losses due to fires, insects, rot and storms; probable yields of various forest products by decades in the future; actual stands of timber by diameter classes of all species.

In addition, the survey will ascertain national, foreign and local requirements for all forest products.

The survey is being made by cruising lines and use of sample plots.

Accurate information will be made available to the trade territories of chambers of commerce, trade associations, banks, railroads, timberland owners, lumber interests, naval stores interests, pulp and paper interests, the wood preserving industry, state departments, agricultural agencies, state revenue and budget bodies and state legislature.

Captain Eldredge said the work had started in Mississippi because cooperation of that state was offered first but that the survey was ready to take up work in other states as soon as cooperative arrangements were perfected.

Visitors Heard

William Wilson, Jacksonville, Florida, of the Florida State Chamber of Commerce, who had just come from Washington, D. C., where he had been in close touch with legislative matters, advocated forestry as one of the avenues of public relief. He told of the harm now being done to the clay industry by England's change from gold to silver standard, of how the lumber industry of this country is suffering from depreciated currencies of other countries, and favored congressional regulation that will restore a fair opportunity for American producers.

Ex-Governor Hugh McRae of North Carolina, originator and head of the Southeastern Economic Council, was recognized and spoke of the Council's interest in promoting forestry.

Georgia's forestry educational program and fire protection methods he thought were worthy of his organization's encouragement for use throughout the south. He spoke of Dr. Herty's work on paper research as beyond anything that had ever been accomplished along the line, and promised great things for the south.

Reports of Officers

President Woolford reported briefly that the association had promoted the combination of forestry and geology in the reorganization plans of state government; got \$50,000 for forestry the association had advocated, and asked for research in paper production from southern woods, which was obtained from the legislature.

The treasurer reported a balance of \$62.67. The committee on next place of meeting reported 5 invitations and accepted the invitation of Savannah to help

celebrate the 200th anniversary of the founding of Georgia.

Mr. J. M. Mallory, Chairman of the Nominating Committee, named T. G. Woolford, Atlanta, president; Judge G. Ogden Persons, Forsyth, first vice president; Jack Williams, Waycross, second vice president; J. Phil Campbell, Athens, third vice president; Joseph A. McCord, Atlanta, treasurer; Bonnell Stone, Oxford, secretary.

The executive committee, C. B. Harman, Atlanta, chairman; Mrs. M. E. Judd, Dalton; Dr. W. M. Folks, Waycross; Gordon E. Reynolds, Albany; H. L. Kayton, Savannah; Alex K. Sessoms, Cogdell; Jno. M. Graham, Rome; J. A. Davis, Albany; B. C. Milner, East Point; Col. R. E. Benedict, Brunswick; Thos. Hamilton, Augusta; W. H. Key, Monticello; W. T. Anderson, Macon; Miss Emily Woodward, Vienna; E. A. McCormick, Gainesville.

Resolutions Adopted

In view of the prospect of increased timber values growing out of research in paper manufacture and the prospect of increased demand for timber along other lines, timber owners were admonished to make ready for the future by protecting the forest and potential forest land from fire.

Resolutions were passed favoring reviving the Southern Forestry Conference; favoring more state parks; recommending that the legislature appropriate funds for completing stream surveys and water analysis of the state; in favor of further support of paper research and development of the paper industry in this state.

Resolutions were passed thanking J. W. Foster, Secretary of the Chamber of Commerce, the Rome Chamber of Commerce, the business people of Rome, the General Forrest Hotel and the press for entertaining and helping the convention.

Jas. A. Fowler, Soperton, was thanked for his contribution of a phenomenal slash pine exhibited at the convention. A resolution of regret and sympathy in the death of Mrs. R. C. Orr of Athens, a charter member of the association was authorized.

The association strongly recommended that steps be taken to have a forest survey made in Georgia. The association called upon delegates to the National Democratic Convention to advocate that the democratic platform contain provisions for adjusting trade differentials caused by change of currencies to protect American producers.

The association favored expenditures on private, state and national forests as a part of the congressional relief measures.

EXHIBITS

The display of exhibits made at the meeting under the direction of J. M. Mallory, chairman of the Exhibit Committee, was considered the best ever made at a similar convention. One-half of the Forrest Hotel lobby was filled with the exhibit material, the most extraordinary of which was a slash pine planted as a seedling in 1926, that has reached 8 inches in diameter one foot from the ground and is 24 feet high. This tree was cut from a plantation of set trees on the lands of James A. Fowler, Soperton, Georgia. It was cut and hauled by truck to Rome and set up in front of the exhibit space. No exhibit attracted so much attention and elicited so much surprised comment.

Another exhibit that attracted much attention was that of the Hercules Powder Company of Brunswick, Georgia and Wilmington, Delaware, showing more than 50 products derived from old pine stumps. Turpentine and rosin derivatives, witt wall board and rayon silk made from residue of fiber, were on display.

The Tubiz Chattelon Corporation of Rome, making rayon silk from wood and cotton linters, made a very interesting and attractive exhibit of raw materials to finished products. Each step in manufacture was illustrated. The finished products, woven from the rayon, were numerous and attractive.

The American Aluminum Company had an attractive exhibit featuring wood preservation with aluminum paint, and aluminum turpentine cups. A part of the exhibit was revolving under electric power.

Modern turpentine still models were displayed by the Bureau of Chemistry and Plant Foods of the United States Department of Agriculture. The miniature buildings and stills and photographs of working plans for construction constituted the exhibit.

The Division of Forest Service had the most extensive exhibit. Panels showed in photographs various lines of activities in forestry, including tree nursery work, plantings, timber protection, work with vocational agricultural schools, vocational forestry camp, publications, news service, samples of wood growth for burned and unburned trees and of thinned and unthinned forests.

SCHOOL CHILDREN FORESTRY MEETING

A meeting for young people was held in the city library auditorium with boy scouts of Rome, 4-H club representatives and vocational school students comprising the audience. J. W. Foster, Rome, presided. C. A. Whittle, Educational Manager of the Department of Forestry and Geological Development, announced the program.

Mrs. M. E. Judd, Dalton, introduced Dr. Chas. H. Herty of New York, who made a short talk about protecting forests from fire thus protecting young people's heritage. Young trees, he said, are the future forests and fire unchecked will kill the young trees. His address was heard with intense interest.

Then followed two moving picture reels by W. D. Young, district forester at Rome. Scout masters led the scouts in a program of songs and yells that added to the enthusiasm of the meeting.

FOREST DEMONSTRATION TRIP

Under the leadership of State Forester 3. M. Lufburrow and District Forester W. D. Young, an inspection trip was made in the afternoon to the Berry School's forest where firebreak construction, seedbed operation, reforestation and forest thinning were observed.

The party was entertained at points by music rendered by the Berry School. The trip proved both interesting and instructive.

Delayed Germination

The Berry Schools believe that they have the record for the length of time that it took for pine seed to germinate after planting.

Loblolly pine seed were planted in the school nursery the 15th of April. No seed came up during the germination period, which is about 14 days after planting. After waiting a few days longer, Mr. Bible, the nurseryman, decided that he would plant the beds to something else, but for some reason did not do so, and during the first week in June the seed came up to a good stand. The total time from planting seed to germination was one and one-half months.

SCHOOL AWARDS TO BE ANNOUNCED AT CAMP

Georgia Forestry Association and Herty Prizes for Vocational Teachers, Schools and Students.

Four prizes for excellence in school forestry work will be announced at the close of the Vocational Forest Camp at Young Harris College August 14.

The annual prize of the Georgia Forestry Association of \$100. goes to the agricultural vocational teacher doing outstanding work in forestry. A prize of \$100. offered by Dr. Chas. H. Herty goes to the school as a whole that does the best work. Dr. Herty also awards \$50. to the student doing the best work and \$25. to the student doing the second best work.

Keen interest has been taken by teachers and students in an effort to secure these prizes, and the winners will have records of which they may well feel proud.

Cypress Knee for 1932

The 10th annual issue of "The Cypress Knee" put out by the School of Forestry of the Georgia State College of Agriculture has appeared from the press and is a very informative and interesting publication. Considerable attention is given to naval stores production in this issue. The pine tree received major consideration.

Those who desire copies of the publication should write G. D. Marckworth, Professor of Forestry, Athens, Georgia.

Naval Stores Practice

Technical Bulletin 298 of the United States Department of Agriculture entitled, "Experiments in Naval Stores Practice," prepared by Lenthal Wyman of the United States Southern Forest Experiment Station, is now available. Mr. Wyman has conducted research in naval stores with headquarters at Starke, Florida, for several years and has contributed much to improve naval stores practice in the south.

The Bulletin contains much practical information founded on years of study. It should be in the hands of every person interested in the forestry side of naval stores production.

Gulf State Foresters

At a June meeting of the Gulf State Section of the Society of American Foresters, held at New Orleans, the following were elected as officers:

President, Fred B. Merrill, State Forester of Mississippi, Jackson, Miss.; Vice President, G. H. Lentz, and Secretary, A. R. Spillers, the two latter being connected with the Southern Forestry Experiment Station at New Orleans.

Timber Protective Organization Formed in Bulloch

The East Bulloch Timber Protective Organization was formed on June 2, and contains 33 members with a total of 12,277 acres. Mr. T. R. Bryan, Jr., of Brooklet, is president and Mr. D. T. Proctor, of Arcola, is secretary-treasurer.

The new T. P. O. lands extend from Brooklet, Ga. southeast along the Savannah highway to Stilson and includes Arcola. Each landowner is to build his own firebreaks and \$130.00 worth of fire pumps will be purchased and distributed with which to fight fires.

The organization plans to build 195 miles of fire-break, employ a patrolman for the three months of January, February and March, put up fire signs, fight fires and do everything possible to obtain efficient fire protection.

Woods-Burner Gets Shot of Lead

A party in the Consolidated area, tipped off beforehand, waited under cover for a man expected to set fire on a certain dark night. On a scheduled time, the burner arrived at the designated point and began striking matches and firing the woods. A flashlight was played on him and he was ordered to halt. The culprit "lit out" refusing to comply and a load of birdshot was fired after him effectively. It is a noticeable fact that no more woods-firing has been done in that particular vicinity.

Increase Protected Area

An additional 5,000 acres has come under organized protection in District 1 this year. The Berry Schools have purchased an additional acreage of 5,000 acres, which will bring the total area in the Martha Berry T. P. O. up to 25,000 acres.

Plans are being perfected for a new T. P. O. to begin operations during the next fire season. The area to be put under protection will be 12,000 acres.

Appling T. P. O. Fights Hard

Headed by L. C. Walker, able Appling Secretary and County Agent, the Appling T. P. O. crowd has certainly fought hard against fires this past season. Fires have been fought several miles away from T. P. O. lands by T. P. O. fire-fighters. It is a county spirit such as this that gets results in keeping down fire losses.

Osierfield Man Burned Badly But Plowing New Breaks

Albert Harper, timber grower of Osierfield, is going ahead laying out and plowing breaks right straight through his burned areas just as if there hadn't been any fire. Mr. Harper refuses to be halted by his losses, believing that persistent effort is necessary to grow timber.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

GOLD IN GEORGIA

Article 5

Georgia has more deposits of gold than any state east of the Rocky Mountains. In recent years interest in Georgia gold has revived and new explorations are in progress.

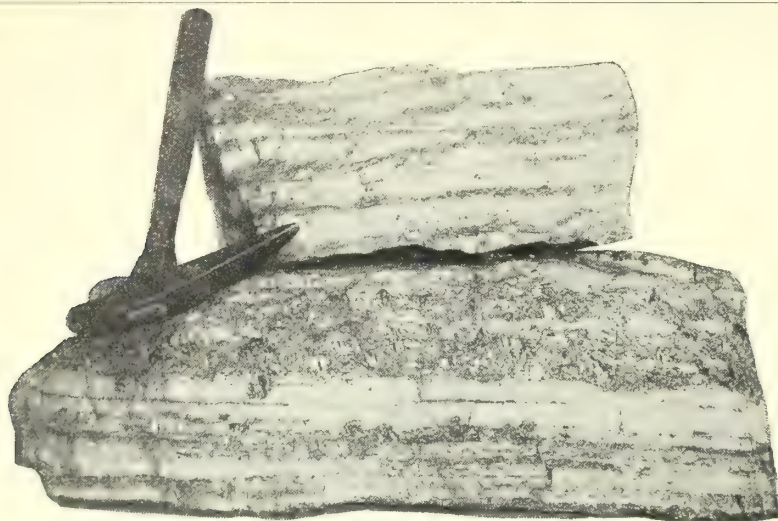
Previous to gold discoveries in the far west, in the forties, Dahlonega, Georgia, was a center of gold production and in 1838 a United States mint was established there. Gold production in the west, followed by the civil war, left Georgia with abandoned gold mines.

In Bulletin 19 of the Geological Survey of Georgia, S. P. Jones, Assistant Geologist, says: "Mining engineers familiar with

Georgia and North Carolina had become of sufficient magnitude to warrant the establishment by the United States Government of a branch mint at Dahlonega, which operated until 1861 and during the period of its operation coined \$6,115,569. Statistics from the director of the mint estimate the entire production of Georgia gold up to 1909 at \$17,500,000."

The year of greatest gold production in Georgia was 1843, when the Dahlonega mint coined \$501,295.

Types of deposits—Three types of gold deposits are recognized in Georgia: (1) Vein deposits, (2) placer deposits, (3) deposits in decomposed rock. The size of veins vary from a few inches to 20 feet in



Samples Gold-Bearing Stone of Georgia

Georgia fields concur in the opinion that if the deposits of a similar character existed in any of the more important gold producing states of the west, they would have been much more extensively exploited. This is doubtless true; and a detailed survey of the territory confirms the belief that the Georgia deposits, especially in recent years, have not received the attention and tests they merit as judged by operations in many other gold mining regions."

History—Quoting Jones: "It is thought by some that gold was mined to a limited extent in Georgia by Spanish explorers when DeSoto's expedition passed through the state.

"In 1829 gold was discovered nearly simultaneously in the Nacoochee Valley region of White county and near Dahlonega in Lumpkin county. Many of the placer deposits of these two regions occurring along small branches and creeks, were exceedingly rich and easily worked, and active mining followed the discovery.

"By 1838 the production of gold in

thickness. The smaller veins are often richer than the large veins. Veins large enough to justify the erection of a mining plant average \$6.00 to \$15.00 a ton of gold, according to Jones. The veins pinch and swell horizontally and vertically. At some mines the pinches and swell occur with fair regularity.

Placer deposits usually occur in regions where there are the most vein deposits, along streams and in valleys containing eroded deposits. Many of the richer placer deposits have been found along small streams, gulches and dry hollows. Beds of some streams, such as the Chestatee River, have been found to justify dredging. Beds of streams have been worked with dredge boats in a number of places. Some of the black sands of the Dahlonega region found along streams have also been worked for their gold content.

Deposits in decomposed rock are unique in the Appalachian Mountains. Rocks are deeply decayed in many localities. In the decomposed rocks are quartz veins. The

gold is found in both the quartz and the decayed rock. Immense cuts have been made in the hills near Dahlonega in working this type of deposit. They have also been worked by the placer method.

Georgia gold as a rule has a high degree of fineness.

Distribution—Gold in Georgia is found in both the mountain and the Piedmont plateau. The greater portion of the deposits are located in well defined narrow belts. These belts parallel in a general way the Blue Ridge Mountains and are known as the Dahlonega Belt, Hall County Belt, McDuffie County Belt, Carroll County Belt, Oglethorpe County Belt, Madison County Belt, Gumlog Belt in Towns County, Coosa Creek Belt in Union County, Hightower Belt in Towns County.

Isolated areas, away from the above mentioned belts are found in Fannin, Gilmer, Lincoln, Hall, Cherokee, Meriwether, Forsyth, Wilkes, Murray, Hart, Walton, Coweta, Campbell, Newton, Henry and Clarke counties.

Present activities—At the present time there are only two stamp mills operating in the Dahlonega district—one at the old Josephine mine on the Etowah River about three miles southwest of Aurora, and the other on Cavender's Creek property about five miles northeast of Dahlonega. The latter plant is operated by some graduate student from the Michigan School of Mines, Houghton, Michigan, and the former by a mining company from Maryland. In addition to these activities in the Dahlonega district, there is considerable prospecting going on at different points and some placer mining. The last named is confined mainly to the stream in the vicinity of the Barlow mine. Some development work is being carried on at the Sixes Mine near Holly Spring, Cherokee county, and W. H. Floker is operating a 10-stamp mill in McDuffie county at the Columbia mine, located about twelve miles northwest of Thomson.

The State Geologist's office received almost daily inquiry about the gold deposits of the state from mining men throughout the country, which fact points, he says, to a widespread feeling that the gold mining industry of the state has a future.

July 4th Rally in Liberty County

A county-wide rally and barbecue sponsored by the Liberty County Timber Protective Organization and the County Chamber of Commerce will be held at the Armory in Hinesville, the county seat, on July 4th. Dinner will be served at 1 P. M. and preparations are under way to have at least 1500 people present to hear the speaking. The principal address will be given by Dr. Charles H. Herty.

The object in having this meeting is to get all the people in the county together to let them hear and see how much wealth could be brought to their county if they would all join a T. P. O. and receive 10 per cent forest fire protection so that they could produce a new crop of timber.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 2

ATLANTA, GA., AUGUST, 1932.

No. 9.

VOCATIONAL FORESTRY CAMP SECOND NOW IN SESSION

**More Than One Hundred Enjoying
Three Weeks' Work at Young Harris
in the Mountains—Prizes to Be
Awarded.**

The second annual vocational forestry camp is now in progress at Young Harris College in the mountains of North Georgia, starting July 25 and to end August 15. The camp is for high school students of the vocational agricultural schools of Georgia, and is conducted jointly by the Department of Forestry and Geological Development and the Department of Agricultural Vocational teaching of the State.

In order to attend the camp a student must have won a camp scholarship in competitive examination and he must have a home project in forestry. The competition for scholarships was keen throughout the State and a high class of students were selected.

Students who attended the first year's camp are back almost 100 percent to take the second year's work and complete the six weeks' course that will entitle them to a certificate of Vocational Forester. More than 50 new boys entered camp this year. In addition, there are 12 agricultural vocational teachers in attendance.

The course of study at camp is practical and designed to teach boys how to do several forestry jobs, as well as to obtain a knowledge of the principles of forestry.

A number of prominent speakers are on the program and several interesting moving pictures relating to forestry, obtained from the United States Department of Agriculture, will be shown.

Forested areas in the mountains have been laid out on which careful work has been done by the staff. Students are required to survey these tracts, identify the trees, estimate the volume of standing timber, mark trees for improvement cutting and thinning, map the forest types and firebreaks, and do other practical jobs.

Time is allowed for games, hikes, auto trips to the Great Smoky National Park, to wood working plants and logging operations, to lakes for swimming and fishing.

Prizes for teachers, schools and students

doing the best work in forestry will be awarded on the night of August 12, at which time certificates will also be awarded to students successfully concluding six weeks of camp work.

Fire and Hardwood Heart Rot

Concerning studies made by the Southern Forestry Experiment Station of the relation between fire scar and heart rot of living hardwood trees has resulted in the following statement: "The data thus far collected seem to indicate that 90 percent or more of the decay in merchantable hardwoods originates from fire scars."

Cordwood in Tree Tops

In forest survey work of the Southern Forestry Experiment Station in bottom land hardwoods of Louisiana, the survey showed $11\frac{1}{4}$ cords in tops of trees with 18 to 20 inches diameter breast high per 1,000 board feet yield, and about one cord per tree 28 to 35 inches diameter.



T. G. WOOLFORD
Atlanta, reelected President of the
Georgia Forestry Association

TREES FOR FOOD, FUEL, CLOTHING AND HOUSING

**Science Is Finding Wood Suited to
Chief Needs of Man in This the
Cellulose Age.**

A German scientist has made sugar from the fiber of wood, and during the World War the carbohydrates of wood cells were converted by German scientists into bread. The fruits of trees, of course, has long been used for food.

It was not so many years ago that the cells of wood were first used to make artificial silk, a tree product now worn by a million of the world's inhabitants.

From time immemorial trees have provided fuel. Coal and natural gas had their origin in forest vegetation which in process of the earth's adjustment became embedded in the earth's strata. Trees have provided man with his chief materials for housing. Thus, the forests are in a measure meeting the four cardinal needs of man—food, fuel, clothing and housing.

How to make trees contribute food and clothing have been objectives of research minds working in this field in recent years. The findings are by no means complete but great possibilities have been opened up.

In time, one may eat bread made from tree flour; one may order a literal "plank steak;" sweeten coffee with tree sugar; get valuable vitamins from a salad of tree nuts, buds and leaves; enjoy desserts of nuts or tree fruits with nut sundaes, and consume as pastries the plates in which the food is served.

Already civilized humanity is attired in silken socks, stockings, dresses, neckties, underwear, pajamas, derived from the cellulose of trees—and how!

Artificial leather made from wood, exceeding in beauty anything derived from animal hides, adorns our easy chairs, covers the seats of automobiles and deluxe buses, compose auto tops and is even used for shoes. Of course, the rubber heels of our shoes, our auto tires, plates for false teeth, and rubber in a thousand forms is derived from trees.

The transparent wrappers that now enfold cigars, cigarette packages, confections and foods of various kinds are made from cellulose of wood. Transparent cellulose

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sheets are used in making the glass of automobiles "non-shatterable."

The quick-drying paints and lacquers contain cellulose. Nitrocellulose enters into the composition of explosives. Thus the cells of woods having fed, housed, clothed and warmed a human being, can end the drama by blowing him into eternity.

The ornate side of human existence is not overlooked, for out of cellulose are made pearls, ivory and gems galore, all so very cheap and so disconcerting to those who go in for the "real."

And they tell us we have only entered the Cellulose Age, that discoveries and uses of cellulose are in their infancy. This statement is here recorded on paper made of wood, read through horn-rimmed glasses made of cellulose by you who are seated on chairs made of wood, with seats stuffed with wooden excelsior under a lamp-shade made of cellulose.

Sanitary drinking cups, plates, napkins, doilies, towels, used once and discarded, come of developing the cellulose industry. Paper cartons made from pulped wood and wrapping paper, in ever-increasing demand, have an important place in merchandising.

Tree gum, thanks to the research chemist, has found more than three hundred uses, and the end is not yet. Chief among the gum producers are the slash and long-leaf pines. In the medicine chest or associated with the cosmetics or among the varnishes, paints, waxes and antiseptics are the products that bled from the wounded pines.

Sawdust and slabs—waste of the saw-mill—are ground, steamed and pressed into

building board. Second-growth pines, subject to quick decay, become durable by creosoting and find wide use as poles and cross-ties. Expensive woods are made into veneer materials to coat desks, doors, furniture and fixtures whose bodies are made of cheaper wood. Cheap wood is veneered to make our exceedingly cheap baskets, boxes, hampers and crates. In these and many other ways, alert minds are finding new and economical uses of woods.

The wood industry is not disconcerted by the competition of steel, concrete and clay—not with all the new uses being found for wood and wood fiber, not with the dawn of this wonderful Cellulose Age with its already many and varied contributions which it is claimed are only forerunners of what is to come.

Here in the South it takes no prophetic power to foretell the development of the nation's main source of paper pulp and other cellulose material. The South is on the eve of this great development. Here are the rapid-growing tree species, the climate that provides long annual seasons of growth; vast timbered areas, excellent transportation facilities, nearness to the chief consuming centers; plenty of power and nearly every ingredient essential to a great wood-manufacturing and cellulose industry.

The man who is growing timber should protect it from fire and care for it. Those who have acres no longer needed for agricultural crops can probably find no better use than to set them to growing trees. Let the trees have a chance, for the signs point to a better day. The Cellulose Age is ahead.

Tung Oil Development

C. C. Concannon, Chief of the Chemical Division of the United States Department of Commerce recently issued a comprehensive report on the status of the tung oil industry, reporting on the progress of planting in the southern states and elsewhere in the world, showing the successful adaptation of this tree to various countries.

Mr. Concannon sounds a note of warning about many promotion schemes fostered to sell real estate and stocks, and urges thorough investigation before investing.

According to the census of manufactures of the Bureau of Census, 10,058,144,000 board feet of timber were cut in this country in 1931, a decrease of 40.1 percent compared to 1930. Southern States cut 2,601,801,000 board feet, a decrease of 39 percent from 1930.

Okefenokee T. P. O. Has One Summer Fire

A fire of incendiary origin burned over about thirty acres on the Okefenokee T. P. O. area during the latter part of July. Due to quick response of fire fighters, the fire was quickly controlled and only 500 cups were burned.

LAND FOR STATE FORESTS, PARKS AND RESERVES FAVORED

Forest Donated for Demonstration Purposes—Committee to Seek Additional Land for This Purpose, Also for Parks and Virgin Timber Preserves.

An area of 100 acres for a demonstration forest in Richmond county, donated by Scott Nixon, for the Nixon estate, was accepted by the Commission of Forestry and Geological Development at its recent meeting, and State Forester B. M. Lufburrow was authorized to conduct the forest as a demonstration for the sand hill region of the state.

The Commission favored obtaining other such forests; also forest area for state parks and reserves of fast disappearing virgin forests. Development Agent Bonnell Stone was appointed to cooperate with a committee of the Georgia Forestry Association, hitherto functioning for the association, headed by Judge Ogden Persons, Forsyth, with President T. G. Woolford of the association, and such others as Mr. Woolford should appoint.

The committee hopes to obtain suitable lands for demonstration forests, state parks and virgin forest reserves by donations to the state to be managed by the Department of Forestry and Geological Development.

WATER RESOURCE SURVEY IMPORTANT TO STATE

Forestry Association and Commission of Forestry and Geological Development to Work for Completion of Survey.

Information which paper mills and other industries requiring considerable water desire in locating plants, is how much and what kind of water is available.

At the annual meeting of the Georgia Forestry Association a resolution was passed urging the Commission of Forestry and Geological Development to ascertain the cost of completing a survey of streams, springs and other sources of water both as to quantity available and chemical contents.

The Commission of Forestry and Geological Development at its meeting in July took cognizance of the resolution passed by the association, approved the proposition and appointed a committee consisting of Bonnell Stone, Development Agent, J. M. Mallory and Mrs. M. E. Judd, members of the commission, to ascertain the cost of such a survey and urge an appropriation from the legislature to match federal funds for this purpose.

PAPER PULP DISCOVERIES BROADEN SOUTH'S OPPORTUNITIES

Loblolly, Longleaf and Slash Pines Equally Good for Making High- Grade White Paper Pulp — Re- search Plant at Savannah Continues Promising Studies.

The announcement made by Dr. Chas. H. Herty at the Rome meeting of the Georgia Forestry Association, that loblolly and longleaf pines are as well suited to making white paper as slash pine, from which white paper had already been made, was an epochal announcement to the South. Since Dr. Herty has made his findings known, the information has spread throughout the country and has been commented on editorially in a vast number of journals. The discovery is regarded as the solution of this country's problem of white newsprint and book paper supply from native woods. The red spruce, from which most paper of this kind is made, has been practically exhausted in the United States and the supply is now coming from foreign countries at increasingly higher prices.

The conclusion is now being drawn that the South will be the source of the greater part of future paper materials and that paper mills will move into this section.

The work at the Savannah Research Plant is concerned now with the problems

Since the production of white pulp is basic to the success of making white paper from southern pines, the problems of making quality pulp as cheaply as possible must of course receive first consideration. While it has been determined that white pulp of good quality can be made, the next question is how cheaply can it be made, which, when scientifically determined, will probably provide the strongest inducement that can be offered to the paper mills to induce them to locate in the South. Dr. Herty stated that some problem of concern to paper manufacturers had already been worked out successfully.

While shortleaf and Virginia pines have not yet been treated, Dr. Herty could see no reason why second growth of these species would not do as well as slash, longleaf and loblolly. These five species of pine constitute nearly 100 percent of pines of the state, so that once pines are used for white paper, every county in the state will have a source of supply.

GEORGIA TIMBER SURVEY URGED BY FORESTRY INTERESTS

Survey Can Be Started as Soon as State Can Qualify for Federal Service— Committees Appointed.

At the annual meeting of the Georgia Forestry Association and the quarterly

Sessoms, Cogdell; W. E. Mitchell, Atlanta, to sound out the situation to see if a survey could be started in southeast Georgia.

The Commission of Forestry and Geological Development having approved of the action of the Georgia Forestry Association, designated Bonnell Stone, Development Agent of the department, to cooperate with the committee appointed by the association and to aid in carrying forward the plans to raise money so that the survey can start as soon as possible.

The timber survey of all states has been made possible by an appropriation of the federal government. When states raise their part of the cost, the United States Forest Service organizes cruising crews and begins work.

Such a survey will give much more accurate knowledge than is available at present of commercial timber now on the land, and estimates of future supplies based on sizes of young trees now growing, more accurate knowledge of present and future naval stores production, and more accurate knowledge of available and potential pulpwood and other products.

Such knowledge as a timber survey will provide is considered essential to interesting capital for developing the state's timber resources and in making known to the state itself what it now has and what it may expect in the future from its timber lands.

PINELAND GRAZING

This discussion is related particularly to the Coastal Plains of the South, a vast area extending from New Jersey to Mexico, comprising large parts of all Southern States and the total area of Florida.

A great part of the Coastal Plain is pine-land interspersed with hardwoods the hardwoods growing principally along streams and in swamps. Pines of this area are slash, longleaf and loblolly, with a scattering of shortleaf and pond pine. The distribution of these pines has been materially influenced by forest fires. The longleaf has demonstrated its fitness to survive in places of greatest fire hazard because of its greater resistance to fire; hence it has taken up positions on higher and dryer lands. From a practical viewpoint, however, slash pine is more desirable than longleaf because of its more rapid growth and its ability to produce more and better naval stores than the longleaf. For these reasons the slash pine is being given preference in reforestation.

The principal native grazing grasses in the Coastal Plain are wire grass, sedge grass, carpet grass and lespedeza. Wire grass and sedge grass are most prevalent, but carpet grass and lespedeza are decidedly the best. Carpet grass provides a long grazing period, staying green nearly the entire year. Lespedeza is a wild legume that not only provides high quality food, but being a legume, is able to take nitro-



Interior view of the Savannah Paper Research Plant of the Department of Forestry and Geological Development of Georgia.

of pulp. No paper has been made, nor will be made, until the present studies of pulping southern pines have been completed.

The beautiful white pulp displayed by Dr. Herty at Rome, were made by the sulphide process, the same process used in treating red spruce. Microscopical tests indicate that the fibre is of high quality and apparently everything that is desired in producing white newsprint and book paper of excellent quality.

meeting of the Commission of Forestry and Geological Development, action was taken favoring the beginning of a timber survey of Georgia as soon as possible, and committees were appointed to see what could be done to promote immediate action.

The Georgia Forestry Association appointed a committee consisting of George Butler, Savannah; Col. R. E. Benedict, Brunswick; H. L. Kayton, Savannah; A. K.

gen from the air and contribute it to the soil for its enrichment. Both carpet grass and lespedeza do best on moist, low lands, which, of course, is true of desirable pasture grasses generally. On the other hand, wire grass and sedge grass grow on both moist and dry lands, but afford grazing for a comparatively short period, and their food value is low.

Not all pinelands are capable of producing worthwhile grazing. In fact, only lands suited to successful growing of carpet grass and lespedeza are worth considering. Other lands may provide wire grass and sedge grass for a short period, but cattle depending on such pasturage will be half starved and stunted in growth the greater part of the year. In riding through areas where wire grass and sedge grass are the main dependence of food for livestock, the gaunt, famished cattle evidence cruelty to animals, abhorrent to every normal person. Anyone, therefore, who intends to pasture cattle in Southern pine-lands should have areas suitable to growing carpet grass and lespedeza.

Good Coastal Plain grazing land is worth fencing and restricting to one's own cattle. Two or three strands of barbed wire will serve the purpose.

The fence will also provide means for confining cattle so that they will graze closely, a thing necessary to get the best pasturage. Close grazing and the tramping incident thereto will tend to eradicate wire grass and sedge grass and to encourage carpet grass.

Grazing and Reforestation

As a rule, grazing will not operate against natural reforestation. But pasturing should preferably start only after a stand of young pines has been secured and the pines are large enough to escape damage from tramping. Occasional thinning will be necessary, not only for the best growth of the pine, but for pasture grazing.

Over a portion of the Coastal Plain the gallberry and palmetto are so prevalent as to smother out a considerable part of the pasture grasses. The gallberry land may afford better honeybee pasture than cow pasture. Where gallberry and palmettos are not abundant, it may pay to grub them out to make greater room for carpet grass and wild legumes. A more economical plan for eradicating wire and sedge grasses, and holding palmetto and gallberry in check, is to run a disk harrow over the ground. This, followed by sowing carpet grass and lespedeza, will give these desirable pasture grasses a better chance to get started. But to make the most of grazing on cheap land, one cannot afford, of course, to go to very much expense in improving the pasture. Extensive grazing may prove more profitable than improving a restricted area.

Where there is a good stand of carpet grass and lespedeza and close grazing is practiced, the forest fire hazard is so great-

ly reduced that the cost of usual fire protection measures will be greatly curtailed. Firebreaks in some cases are plowed and sown to carpet grass for the purpose of affording grazing as well as a protection against the spread of fire.

At any rate, if one has a stand of carpet grass, there is not only worthwhile pasturage, but the forest fire hazard is removed to such an extent that no one would ever consider setting such forest-pasturelands on fire. If grazed closely, there would be little that would burn.

FORESTRY QUESTION BOX

When does slash pine begin to form heartwood and what percent of heart is found at different ages?

Investigations of the United States Forest Service reported by Benson H. Paul is as follows: "The wood from trees 8 to 16 years of age contained no heartwood; that from the 27 year old stand contained 3.7 per cent of heartwood; and that from the 30 to 35 year old stand contained 4.3 per cent of heartwood."

From this data the exact year when heartwood appears is not shown, but it is evident that trees, under normal conditions, will attain pulpwood size before heartwood appears; and even when heartwood appears in lower cuts, there may be no appreciable amount in the upper cuts.

What is the weight of wood of different ages of slash pine?

Since pulpwood is sold according to weight, it is of interest to know the weight of wood of different aged slash pines. According to the authority above mentioned, the weight per cord of 8 to 16 year old trees is 2,240 pounds; 27 year old 2,600 pounds; of 30 to 35 year old trees 2,752 pounds. The increase in weight is due principally to accumulation of heartwood.

What is the best known record of slash pine growth in Georgia?

The greatest growth record known is on the pine plantation of James A. Fowler at Soperton, Georgia. Trees planted in 1926 and kept free of fire and otherwise grown under natural conditions without artificial stimulation, have attained around an inch a year in diameter growth, the best specimen reaching a diameter of 8 inches, one foot from the ground in 6 years from planting.

Does the width of the tree growth ring influence the number of resin ducts in a slash pine?

According to studies made by the United States Forest Service and reported by Victor C. Hobert, it was found that generally more resin passages were present in the wider rings. In the material studied approximately 60 per cent of the vertical resin passages were in the summer wood. It was believed that marked difference in the number of resin passages might be found if extremely narrow or extremely

wide annual rings were compared.

Does temperature affect the southern pine beetle?

According to the United States Bureau of Entomology, the high temperatures of October and November 1930 caused beetles to mature and emerge in the fall that otherwise would have wintered over in larval, pupal and adult stages. A large percentage of the broods were destroyed by woodpeckers and were not able to start another generation. This brought about such effective natural control that beetles were exceedingly scarce in 1931.

THIRD DISTRICT

C. N. Elliott, District Forester

Augusta

Forest Fire Pumps Save Factory

Two forest fire pumps, purchased recently by Mr. C. H. Jordan, Vice President of the Jasper County T. P. O., were the means of saving one of the large plants of the United States Bobbin and Shuttle Company, located at Monticello, Ga. The pumps had been purchased for use on the Timber Protective Organization, but had not been taken to the forest, when fire broke out in the attic of the plant. The fire was quickly extinguished with the forest fire pumps. "Pine tops will have to be used by my tenants until I can order more of those pumps", said Mr. Jordan.

Hart County Pine Plantings

Measurements made on the two year old pine plantation on the McMullin farm in the Reed creek section of Hart county were made of slash and loblolly pine growing side by side. The loblolly attained the best growth, growing from 15 to 30 inches, while the slash averaged approximately 12 inches in growth.

County Agent Westbrook is to be commended for the excellent work he has done in interesting the farmers of Hart county in reforestation. While most of the county is made up of good farm land, there are places where trees will be the best crop. The county agent has aroused much interest in the planting of such areas.

Rare Tree Specimens

The old Fruitlands Nursery in Augusta is being transformed into greens, fairways and roughs. Seventy-five years ago this property was purchased by P. J. Berckmans, who started one of the finest nurseries the south has ever known. As well as growing flowers and fruits, Mr. Berckmans imported and planted a number of trees from all over the world.

Near the present home of P. J. A. and L. A. Berckmans stands a cork oak, a beautiful specimen, which was received about 1860 from the United States Depart-

ment of Agriculture (then the United States Patent Office). Immediately behind the home is planted a Japanese golden rain tree which in blossom is one of the most attractive trees I have ever seen. Approximately 100 varieties of azalea are scattered over the property, which give the woods a radiant color in spring.

One of the rare laurels, *Elliottia Racemosa*, is planted near one of the springs. At present it is said that only three of these plants are in existence, two of them being in the Royal Botanical Gardens at Kew, England. The other grows on the Berckmans Estate, being planted there some sixty years ago by Mr. Berckmans, who also sent the two plants to England.

Fire Control Protection Well Under Way in Burke County

Under the leadership of Mr. John J. Jones and Mr. Joel Chappell, president and secretary respectively of the Burke County Timber Protective Organization, approximately 20,000 acres of land have been signed up in the organization. These are only a few of the large land owners, and many who are interested have not been contacted at this time. Burke county is in need of fire protection more than any other county in the state. It was estimated by reliable persons that approximately 90 percent of the county burned last year. This made the land owners of the county realize some sort of protection from fire is necessary. The organization is now expected to be much larger than it was at first thought. Members have signed up from all sections of the county and the organization bids fair to become a county-wide proposition.

Fire Control Plans in Hart County

A plan to keep fire out of forests of Hart county is being worked out by the vocational teachers of that county. As there is a vocational school in almost every district of Hart county, the teachers plan to organize a fire control unit in each school for the suppression of fires in the districts where the schools are located. Work on this program has temporarily come to a standstill during the summer months when all schools are closed. Plans to continue this work in the fall, however, have been made.

Jefferson County Timber Protective Organization

Members of the Kiwanis Club at Wrens have shown interest in the organization of a Timber Protective Organization in northern Jefferson County. This part of the county is cut up into small farms and in all forest sections so that fire plans for all owners will be much more effective than plans for a large timber protective organization.

FOURTH DISTRICT W. G. Wallace, District Forester Columbus

How a Farm Loan Company Is Fighting a Single-Handed Battle Against Forest Fires

Within the past few years a certain insurance company, like many others, suddenly found itself in possession of considerable real estate acquired through its farm loan department, due of course, to the inability of the landowners to repay the money borrowed on farms. This article refers to a particular tract of land lying in Stewart county, but is characteristic of many such areas throughout Georgia.

Three years ago a seasoned woodsman, Mr. W. F. Dean, was placed in charge of this tract and entrusted with its protection and management. Before permanently employing Mr. Dean, this company had this woodsman make an estimate of the standing timber on the tract and also an estimate of the growth of timber that could be expected within the following ten years. Convinced that this would be enough to pay carrying charges on the investment and give a profit, this company employed Mr. Dean in good faith and set the task before him.

The task: The management and protection of 4,400 acres of land which is separated into several individual bodies by other privately owned tracts. This, of course, adds greatly to the amount of boundary that must be protected from the encroachment of forest fires set on adjoining lands.

During the three years that Mr. Dean has had this tract under protection, from 10 to 22 percent of the total area has burned over each year. This is in comparison to an average of from 40 to 60 percent of the total area burned annually in that section. Until after the first of April of this year Mr. Dean had succeeded in keeping the total area burned to about 150 acres. On a dry, windy day around the middle of April a negro decided to burn to "improve the grazing" for his cattle. There was not enough evidence to try for a conviction of violating the Georgia forest fire law. This one fire burned through more than 800 acres of forests belonging to the insurance company.

Now, to arrive at the point in mind. The above is merely a case of an individual landowner trying to protect his own forests with very little aid from the outside. There are multitudes of similar cases all over Georgia, a number of similar cases being in the same locality. If it was merely a matter of fighting one's own fires the matter would be simplified; but the majority of fires on a protected area usually have their origin on unprotected areas.

Since each landowner is dependent on his neighbor for protection from forest fires the logical course, it seems, would be

to organize and cooperate in keeping down such fires. There are multitudes of forested areas in Georgia whose owners cannot be there to see to the protection of these areas. A Timber Protective Organization supervised by the state Division of Forestry, and receiving financial aid from the state, should be the solution to such a problem. Increased tree growth by protection from forest fires results in increased returns on the investment.

If one man succeeded in reducing fires on 4,400 acres by 30 to 40 percent without outside cooperation, is it not logical to believe that active cooperation between a group of landowners would result in a much greater reduction of forest fires and the total area burned each year?

FIFTH DISTRICT H. M. Sebring, District Forester Macon

Dodge County T. P. O.

The Dodge County Timber Protective Organization was organized July 19 at Eastman. Eleven members owning a total of 10,435 acres are in the organization at present but more are expected to join by fall. J. T. Coffee was elected president, and W. D. Hillis, County Agent, is secretary-treasurer.

A cooperative patrol will be carried on by the organization due to the land being cut up by farms and not lying in a contiguous body. Each land owner will construct his own firebreaks and look after his own patrol and fire fighting work. The land listed in the organization is in two main bodies, one lying between Eastman and Rhine, and the other lying around Jaybird Springs.

SIXTH DISTRICT Jack Thurmond, District Forester Savannah

Great Forestry Rally

On July 4th, the Liberty County Timber Protective Organization and Liberty County Chamber of Commerce sponsored a county-wide rally and free barbecue, which was attended by some 1500 men, women and children who heard Dr. Chas. H. Herty and State Forester B. M. Lufburrow speak.

This meeting will long be remembered by the people of Liberty county and those living out of the county and owning timber land in this county, who were present, for Dr. Herty brought them a message that will in a few years, if heeded, yield them more money than any business they could possibly go into, that is, practicing fire protection on their timber land and

raising timber as a crop for pulp wood.

In his talk Dr. Herty brought out the fact that good white pulp could be made from the three pines which grow so abundantly in Liberty county.

This Fourth of July meeting was a success for now at all cross roads stores and courthouse and other places where people gather to talk, the conversation is about ways and means of keeping the woods rough and growing a crop of young timber on their land.

Timber Growing Profitable in Chatham

Mr. J. A. Carter and his two brothers have been trying to keep fire off their four thousand acres of timber land in Chatham county near Bloomingdale for the past four years. Their land is not in a Timber Protective Organization yet but soon will be as several of their neighbors have expressed a desire to come together and form a cooperative organization.

The Carter brothers have some 2500 acres under fence and raise a good grade of beef cattle on their land along with the young timber which is coming. Their range is not burned and affords sufficient food the year round for the cattle. These brothers fought fire last year and constructed fire-breaks by plowing and burning strips through their land. Before starting in on fire protection, the Carter brothers had scattered trees over their entire tract; now after four years they have a good stand of young timber and they will tell anyone that fire protection pays.

SEVENTH DISTRICT

C. Bernard Beale, District Forester
Waycross

Wayne T. P. O. Making Plans

Wayne County T. P. O., now having 51,000 acres actively protected, will go at fire protection harder than ever next year. A. E. Knight, T. P. O. President, who suffered high loss this year, when told by a farmer that he should abandon his fire protection work, since he had most of his land burned this year, replied: "Would you stop farming if your mule were to die?" This shows how thoroughly some men believe in the fundamental soundness of fire protection through fire breaks and organized effort. Mr. Knight had fire breaks this past season, but due to the high inflammability of the woods and terrific winds, it was almost impossible to control his fires. He is going ahead systematically and with determination, however, cutting out all of his burned timber, and preparing to get his lands in better shape than ever before with fire breaks. This is the spirit that will make commercial forestry a success in this section.

EIGHTH DISTRICT

H. D. Story, Jr., District Forester
Albany

Leconte Saw Fly

A severe outbreak of the Leconte saw fly occurred on the land of W. C. Potter in Dougherty county, the attack being on young slash pine planted four years ago. From 55 to 60 percent of the young pines planted on 200 acres showed signs of the insect. Defoliation was heavy in some instances and the whole plantation seemed in for trouble.

The district forester sprayed 100 trees with a lead arsenate solution consisting of 4 pounds of lead arsenate to 100 gallons of water. Forest fire pumps were used for spraying the trees which were three to eight feet high. An inspection of the trees after the application of spray showed that all the worms had been killed. The entire plantation was then sprayed by W. C. Potter, manager in charge. The cost of materials for spraying the infested trees, covering in all about 100 acres, was only \$1.35.

Georgia Forest Products Constructing Field Telephone System

On their Hazzard's Neck tract in Camden county, the Georgia Forest Products Company, member of Camden T. P. O., is constructing a system of telephone lines. Plug-in stations will be provided at intervals in order that patrolmen will lose no time in reporting fires. It is expected that these lines will help materially in facilitating fire control.

Pulpwood Consumption in U. S.

Out of 15,000,000 cords of pulpwood used in the United States in 1930, 8,500,000 cords were imported from other countries, either as wood or the equivalent — pulp or paper.



Young pine attacked by Leconte Saw Fly.
Note how insect has removed the pine needles.



Leconte Saw Fly at work defoliating a twig
of a pine tree.

Bickley T. P. O. Formed

In the Bickley region of northwestern Ware county, approximately 10,000 acres have been signed up in the formation of the Bickley T. P. O.

W. M. Denton of Bickley will serve as Secretary-Treasurer and A. N. Gillis as President. Using mules and own labor, the members plan to plow out fire breaks eight or ten feet in width. Other landowners in that section will be urged to join.

Rosin in Soap Industry

The principal domestic uses of rosin in the order of their importance are (1) in sized paper, (2) in paints and varnishes, and (3) in soaps. Paper manufacture usually takes the lowest, paints and varnishes the highest, and soapmaking the medium grades. There is considerable overlapping, however, as the better paper grades and the poorer varnish grades are used in soaps. Demand has been increasing in the paper industry and, to a less extent, in the paint and varnish industry, but, except for an upward trend in 1929, it has been decreasing in the soap industry because of the substitution of white for yellow laundry soaps.

The quantity of rosin actually used in soaps in the United States subsequent to 1914 and the quantity which would have been used if its consumption, instead of decreasing, had increased to the same extent as did the total consumption of oils, are shown in the following tabulation. In making this estimate, the consumption of rosin in soapmaking in 1914 is taken as the base. The trend from yellow to white laundry soap began before 1914, however, 290,000,000 pounds of rosin being used in 1909 as compared with 185,000,000 pounds in 1914.

Blunt-pointed nails cause less splitting than sharp-pointed ones, according to tests of the United States Forest Service.

Nearly three cords of wood are required to produce a ton of paper.

FORESTS CONTROL EROSION FIRES INCREASE LOSS

Thirty Times More Water Runs Off Burned Over Forest Land Than Unburned.

Leaves covering the ground not only hold a large amount of rainfall themselves, but they keep the "pores" of the soil open and allow it to absorb much more moisture than land not so covered, according to soil erosion specialists of the United States Department of Agriculture.

In Oklahoma an experiment is in progress to discover how much water the leafy covering in wooded land holds. Measurements showed that the amount of water held on the land was much more than the leaves could hold. The investigators found that the leaves filter the water, keep it clear and let it soak into the soil through the many cracks and holes. Where there is no leafy covering to filter the water, silt fills these pores and more water then runs off the land, carrying eroded soil.

Two wooded plots of equal size were observed. One was left in the natural state, the other had the leafy covering burned off with a blow-torch. A special device measured the run-off of water and the wash-off of soil. In two years, 30 times as much water and 15 times as much soil were washed on the ground carpeted with forest leaves as on the burned-over land. This shows the importance of protecting sloping land from the evil of excessive run-off rain water and the costly loss of soil that goes with the flowing water.

A study of foreign public-forest policies, made by the United States Forest Service, shows that while public control in the United States has been almost wholly confined to requirements for protection against fire, other countries, as a rule, have gone considerably farther, particularly with respect to forests that serve to prevent soil erosion or to regulate stream flow, or that serve other public interests. Most of these countries are at the same time gradually extending the area of public forests.

Fires Damage Young Pines

Measurements on burned and unburned singleleaf pine in North Carolina show that annual woods burning retards the growth of the trees, the United States Forest Service states. For thirteen years, two plots were observed, one of which was burned over annually and the other kept free from fire. On the unburned plot the trees grew 10 per cent faster in height, 9 per cent faster in diameter, and 22 per cent faster in volume.

Discarded matches and burning tobacco planted National Forests in 1872 places during 1931, according to the United States Forest Service.

Small Seedling Trees Cut Planting Costs

Trees of some species used for reforestation are set out when very small, so small that the farmers receiving shipments from the state nurseries are often surprised. Trees are shipped when very young to keep down expenses of transportation, handling, and planting. Seedlings of most pines are 3 to 10 inches tall. Most hardwood seedlings sent out are 10 to 18 inches tall. Trees for farm forest planting are distributed by the state forestry departments of 37 states. The United States Forest Service cooperates with the states in the production of trees for farm forest planting. Trees for ornamental planting are not grown under these arrangements.

Timber Strength of a Tree Varies

The strongest lumber in the redwood tree is near the bottom, says the Forest Service of the United States Department of Agriculture.

In testing both virgin and second-growth redwoods, the department found that the difference in the specific gravity between the wood at the top of the tree and the bottom was about 15 per cent, with the greater specific gravity for the lower part. Lumber with this greater specific gravity is stronger.

This knowledge is useful to lumber users seeking structural material, because they can select the lower logs for their purposes.

Forest Fire Depletes Game

A forest fire which swept winter grazing grounds of deer in the Lassen National Forest in California is held responsible by the local United States Forest Service rangers for the death of many of the animals by starvation last winter. The greatest mortality was among last year's fawns. Although fleet of foot, the deer does not range far from its native haunts. Deer on unburned areas not far distant were found to be in good condition.

Biggest Living Sassafras

William Younts, a farmer near Whitesburg, Kentucky, believes he owns the largest living sassafras tree. It is more than 100 feet high, over 60 feet to its first branch; it is more than 14 feet in diameter at its base and four and a half feet in diameter two feet from the ground. The tree is in flourishing condition.

Maple Shoe Heels

One of the uses to which maple is now put is shoe heels. Hard maple is selected and run through nine machines to make it ready for lady's slippers.

To encourage reforestation of lands in Tennessee, the state forester is offering lots of 1,000 trees free to farmers who will plant and maintain demonstration forest plantings adjoining important highways, reports the United States Forest Service.

NEW FORESTRY LAW FOR MISSISSIPPI

Statute Provides for Assessment for Fire Protection — Old Law Is Repealed.

Under a new Mississippi law, a county board must make the assessment on timber lands and the uncultivable acreage a part thereof upon a petition signed by a majority of the freeholders of the area to be protected. This special annual tax shall not exceed 3 cents per acre.

The 1924 law relative to taxation, protection and regulation of unimproved lands was repealed by the last legislature at the request of the Mississippi Forestry Commission. State Forester Fred Merrill says:

"This law had a thorough trial for nearly eight years and it was found to be utterly worthless. It was enacted apparently to encourage reforestation and provided a 10-year tax exemption on young growing timber. However, hundreds of Mississippi landowners, after thorough investigation, found that the exemption provided did not offset the added cost for surveying, listing and protecting the property so not a single acre was listed during the time that the law was in force. Repeal of the law removes nine sections from the 1930 Code, simplifies correspondence in the offices of the State Forest Service, and opens the way for legislation that will be worthwhile."

Holding Bark on Logs and Slabs

In some sections of the Appalachian region, particularly at tourist resorts, buildings are erected of logs and slabs with bark intact. How to keep the bark on structural material is of interest to all who like to have cottages and cabins with a bark exterior.

One method is to remove the bark carefully, treat it with creosote or some other chemical that will repel insects and organisms of decay and then tack the bark back to the timber.

Oldest Living Thing

The oldest living thing in existence, the Sequoia Washingtoniana, now grows only in the Sierra Nevadas. Its cousin, the Sequoia sempervirens, or redwood, is found only on the California coast, says the United States Forest Service. These trees are the only survivors of species which once spread over North America, Europe, and Asia.

Ready-Cut Log Cabins

In these days of ready-cut houses, announcements are made that a ready-cut cabin may be obtained. Instead of logs being used, slabs having a log-like surface are used for the exterior and a smooth surface is given the inside. Edges are tongued and grooved to make airtight structures. No chinking is required.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

FULLERS EARTH

Georgia leads all states of the Union in the output of fullers earth, the annual return from this material having reached a maximum of about \$2,000,000. The largest fullers earth mine operation in this country is in Decatur county.

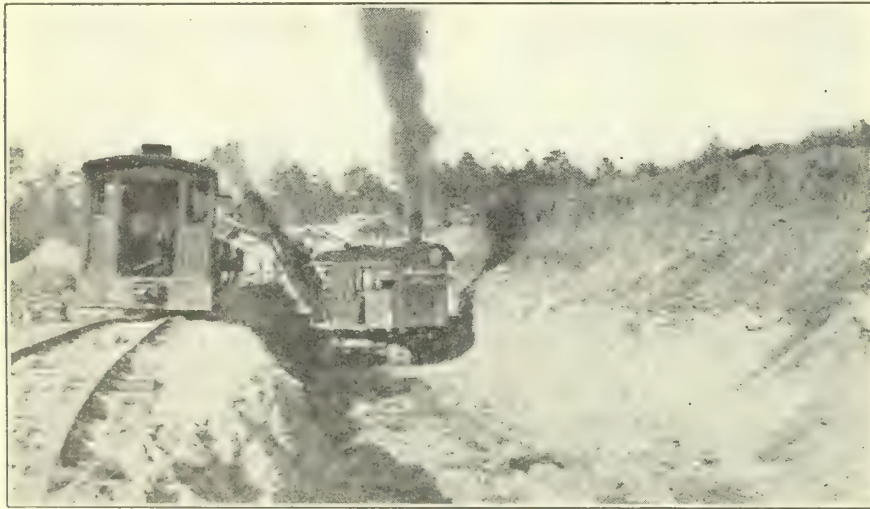
Fullers earth is a clay-like material, differing from brick or pottery clay in being more porous or having more sand or silica, and less kaolin or clay. Its porosity and absorptive power are characteristics that make it valuable.

Uses. The name "Fullers" came from the use of this material on woolen cloth during the process of fulling for absorbing and removing grease. The use of fullers earth dates far back. Pliny tells of washing and scouring cloth with "the earth of Sardinia." Fullers earth for cleansing cloth has been superseded by soap and alkalis, but new uses have been found, particularly in bleaching edible oils such as cottonseed oil, peanut oil and olive oil, and in refining petroleum; also in the

will float on water. It is brittle and lacking in the plasticity belonging to ordinary clays. The color may be white, grey, drab or yellow, and when wet is grey or varying shades of olive green.

Two large areas in South Georgia contain deposits of fullers earth, one in the upper and one in the lower part of the coastal plain. The principal deposits in the upper belt are in Twiggs, Bibb, Columbia and Stewart counties but occurrences are noted in other counties along the Fall Line.

Fullers earth of good quality seems to have been deposited only in estuaries several miles south of the ancient shore line which marked the division between the Piedmont Plateau and the present Coastal Plain. At some points organic or carbonaceous influences are noted, forming lignite such as is found at Grovestown and observed in fire clays near Gibson. Calcium carbonate is present in varying quantities and where more abundant, the clay becomes harder.



Fullers Earth Deposit and Mining Operation of Attapulgus Clay Company in Decatur County.

manufacture of soap, certain medicines and in numerous ways as an absorbent.

History. The first attempt to work fullers earth in the United States was in Arkansas in 1890. The deposit at Quincy, Florida, was opened in 1893 and has proven an important source of supply. Georgia did not become a producer until 1907. While fullers earth has been found in 17 states, only six have become important producers, Georgia, Florida, Arkansas, California, Massachusetts and Texas.

Occurrences in Georgia. Fullers earth occurs in beds of varying thickness and is characterized by extreme porosity and lightness. When thoroughly air-dried it

In Twiggs and Houston counties the deposits attain a maximum thickness of 100 feet, thinning out to a thickness of 20 feet in Jefferson and Columbia counties. The deposits are usually overlain by red sand of the Barnwell formation, and surface appearances occur in ravines, lower slopes of valleys, and where exposures were made by streams or by erosion.

An important operation is located at Dry Branch in Twiggs county, where the General Reduction Company began operations in 1908. Other fall line counties in which fullers earth occurs in deposits of varying quantities are Bleckley, Houston, Crawford, Wilkinson, Jones, Baldwin,

Washington, Jefferson, Burke, Richmond, Columbia.

The southern occurrence of fullers earth is south of the counties mentioned in what is known as the Alum Bluff Formation, extending over a wide area with a northern border of Waynesboro, Tennille and Vienna; defined on the east by a line extending from the mouth of Buck creek on the Savannah river through Sylvania, Reidsville, Blackshear and the western edge of the Okefenokee Swamp; on the west by the Flint river. The fullers' earth of this region is in thinner beds than that of the old shore line further north, and is finer of grain. When dry it is harder and it is also lighter than clays further north. The main operation of this deposit of fullers earth is in Decatur county at Attapulgus where, as has been stated, is now the largest fullers earth operation in the country. The Attapulgus Clay Company is conducting the operation.

Other counties in the southern part of Georgia of known deposits of fullers earth are Grady, Thomas, Brooks, Lowndes, Echols, Appling, Toombs, Screven, Randolph and Clay, but none of the deposits in these counties has been exploited.

Fuller's Earth in 1931

The total quantity of fuller's earth sold or used by producers in the United States in 1931 amounted to 288,400 short tons, valued at \$3,055,570, or \$10.59 a ton, according to figures of the United States Bureau of Mines. This was a decrease of 14 per cent, or 47,244 tons, and represented a shrinkage of 29 per cent in value, or \$1,271,135 less than 1930. However, the output was larger than in any year prior to 1929 and was 173 per cent greater than that of 1921, while the value was more than that of any year prior to 1926 and was 55 per cent higher than that of 1921. Georgia was the leading producing state in 1931 and has been for eight years. Florida was second, and Illinois, displacing Texas, was third. Production was reported by 22 operators in 1922, the largest number ever recorded.

The most valuable walnut tree on record was a curly walnut sold in North Carolina for \$1,500, the lumber of which when placed on the car brought \$3,000, and which when cut into veneer stock in New York was finally sold for nearly \$60,000.

Nearly forty million board feet of lumber are used annually to make lead pencils for American consumption.

Mr. Alex Sessoms, Cogdell, Ga., member of the Commission of Forestry and Geological Development is on an auto tour of the west, leaving July 8, to be gone until September. He is accompanied by his family.

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No. 10

Second Vocational Forestry Camp Concluded Successful Program of Work

Three Weeks' Work and Entertainment at Young Harris College Concluded With Brilliant Program of Speakers, Awarding Prizes and Certificates—High Class of Boys Study Practical Forestry and Become Enthusiastic Forestry Advocates—Entertainments, Athletics and Excursions Add to Enjoyment—Leaders Visit Camp and Are Pleased With Undertaking.

The second Vocational Forestry Camp held under the direction of the Department of Forestry and Geological Development and the State Department of Vocational Education at Young Harris in the mountains, came to a brilliant close after three weeks of intensive training given 100 vocational high school boys from rural high schools scattered over the state. The students were a select, high class, earnest lot of boys. The work they did was highly satisfactory. Members of the Commission of the Department of Forestry and Geological Development, Officers of the Georgia Forestry Association and other leaders who visited the camp and noted the work carried on, expressed themselves as delighted with the undertaking.

The entire forestry staff and the educational manager constituted the faculty. Classroom work took comparatively little time, much of the work being carried on in the woods in teaching tree identification, plane surveying, timber cruising, forest fire prevention, thinning, studying forest types and tree growth.

Work was mixed with entertainment and recreation. The night programs of music, speaking, moving pictures and stunts, and athletic events kept interest and enthusiasm high, culminating in a final program of speaking and awarding of prizes, certificates and honors. Camp students and agricultural vocational teachers left the mountains full of enthusiasm and determined to be forestry missionaries in their respective communities.

Certificates of Vocational Forester were awarded to 40 boys who had successfully completed 6 weeks of forestry training. This certificate recommends the holders to be competent to do a number of non-technical forestry jobs. It was signed by the governor, the state forester and the educa-

tional manager of the Department of Forestry and Geological Development.

Camp Addresses

The first night session of the camp was addressed by Bonnell Stone, Development Agent of the Department of Forestry and Geological Development and "Father of Forestry in Georgia." Prof. G. D. Marckworth, head of the Division of Forestry of the State College of Agriculture, spoke on forestry as a profession. C. H. Alden, of the state Bureau of Entomology, spoke on insects in relation to forests. Prof. Thos. Burleigh of the United States Biological Survey, gave an illustrated lecture on birds and their relation to forests. State forester B. M. Lufburrow spoke on the forestry program of the state. R. W. Smith, assistant state geologist of Georgia, told the audience of how hills, valleys and soils of the state were formed and their relation to forests. C. B. Harman and J. M. Mal-

lory, members of the Commission of Forestry and Geological Development, made encouraging talks on forestry and told of the interest the commission is taking in the educational program of the state. Paul Chapman, director of Vocational Education of the state, gave an inspirational talk to the camp.

Representing the Vocational teachers of the state, Prof. C. F. Richards of Camilla, spoke on teaching forestry in the vocational schools. Rev. Nathan Thompson of Covington gave a brief inspirational talk and President T. J. Lance, of Young Harris, gave both welcome and farewell talks.

The closing program was featured by inspiring addresses by T. G. Woolford, President of the Georgia Forestry Association, and by Dr. Chas. H. Herty, research chemist working on paper manufacture from southern woods at Savannah, under the direction of the Department of Forestry and Geological Development. Both of these speakers awarded prizes offered to schools, teachers and students.

Prizes Awarded

The Georgia Forestry Association prize of \$100 offered the white teacher in the vocational agricultural schools, was presented by Mr. T. G. Woolford, Atlanta, president of the association. It was received by Felix B. White, vocational agricultural teacher of Georgia Industrial Col-



VOCATIONAL FORESTRY STUDENTS COMPLETING CAMP WORK

First Row—Clarence Edmondson, Edmund Dillard, Weldon Spearman, C. W. Grant, Jr., Merrill Boyd, Frank Hendrix, Howard Adams, Clarence Carson, Herman Gilder, Garnet Craig. Second Row—Ansel Meador, Merlin Burt, Fulton Morey, Buren Claxton, Clayton Cordell, Sidney Jackson, Ezra Taylor, Wesley Moore, Dorsey Morrison, Arthur Steedley, Glen Rhodes, Jim L. Gillis, Jr. Third Row—George Garrard, Ralph Watson, Marvin Lloyd, J. C. Ellington, Joe Johnston, William Johnson, Horace Ayers, Broadus Orr, William Seaman, Clark A. Rodgers, Harry Seymour, Herman Tyson, Howard Carlan. Fourth Row—H. J. McCurry, Jr., Julian Royal, William Sanders, Henry Dean, Robert C. Radford, Robert C. Hall.

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lege at Barnesville. The award was made on the recommendation of Bonnell Stone, B. M. Lufburrow and C. A. Whittle after a thorough investigation of work of the teachers of the state. The record of work done by Mr. White appears in the July issue of the "Review."

The Herty prize of \$100 offered to the school doing the best all-round work in forestry was presented by the donor, Dr. Charles Herty, to the Soperton High School, in which Prof. R. D. Pulliam is the vocational agricultural teacher.

The Herty prizes offered students doing the best work in forestry were awarded to Arthur Steedley of Waycross, a student of Georgia Industrial College at Barnesville, who won the first prize of \$50, and to Jim L. Gillis Jr., of Soperton High School who won the second prize of \$25.

The Chapman prize of \$5 to the student writing the best essay on what the vocational forestry camp means, was won by John Noland, student of the Vocational and Trades School at Monroe.

The students making the highest average grades at the two sessions of the forestry camp were Harry Seymour, first, Bowman, a student of Georgia Industrial College; Bill Seaman, second, Waycross, student of Waresboro High School and Horace Ayres, third, Villa Rica, a student of the A and M School at Carrollton.

Athletic Honors

Athletic rivalry between first and second year students was keen and the contests were so close that in the final outcome there were only seven points difference. The Athletic Director this year was J.



PROF. FELIX B. WHITE

Georgia Industrial College, Barnesville, who received the \$100 prize from the Georgia Forestry Association for best work in teaching forestry.

D. Davis, vocational teacher at Pavo, who organized and carried out athletic events in a very thorough and satisfactory manner.

Perhaps the most spectacular event was the 34 mile relay race. The second year boys ran 8½ miles to Blairsville and back to Young Harris while the first year boys ran 8½ miles to Hiawassee and back. Boys were placed at quarter mile intervals with 17 in each team.

Messages were carried to the newspaper editors of both towns who were ready with messages for the return trip. The time over the course was 1 hour and 16 seconds



R. B. PULLIAM

Teacher of Soperton High School, which school won the Herty prize for best work in forestry.

made by the second year boys with a hot finish of only 10 seconds difference between the two teams.

Contests were carried on in baseball, basket ball, tennis, swimming, horse shoe pitching and in track events. Efforts to have a tug of war between the classes failed because a two inch rope was not strong enough and snapped in two under the powerful tug.

Excursions

Two official excursions were conducted, one into the Great Smoky mountains along the Little Tennessee river through big mountains and past lakes, stopping at Calderwood where lunch was eaten and swimming contests were carried on. The second excursion was into the Great Smoky Mountain National Park by way of Bryson City, the Cherokee settlement, New Found Gap, into Tennessee and to the picturesque "chimneys" of the Sugarland mountain. On this trip the party traveled the highest highway east of the Rocky mountains, reaching an elevation of 5,050 feet at New Found Gap on the great divide between North Carolina and Tennessee.

About 20 of the party stayed over a day and hiked to the top of Clingman's dome in the Great Smoky Mountain National Park, a peak now claimed to be the highest east of the Rocky mountains.

Night Entertainments

Camp attendants and people in the community greatly enjoyed the night programs. Singing led by District Forester C. N. Elliott, Augusta, was a "howling" success—really very good singing. Mrs. W. G. Wallace, wife of District Forester Wallace, Columbus, with her Hawaiian guitar accompanied by W. D. Young or C. N. Elliott with guitars, provided music that was enthusiastically received. W. D. Young singing and accompanied with his guitar was a favorite who was encored and encored. Bill Crosby, student of Sale City, with his fiddle and Robert C. Radford with his harmonica delighted the audience with their music. Bill Seaman, Waycross, and Miss Mary Callahan, Wrens, rendered delightful music as pianists.

Stunt night was a great occasion in which performers among students, teachers and their wives, had a part. The athletic stunts of H. M. Sebring, district forester, were the kind that one pays money to see in vaudeville and circuses. Mrs. M. D. Mobley and her daughter Mary, recited admirably and were great favorites at various performances. A playette directed by Mrs. Waddell of Stockton was the attraction one evening. Skits and stunts of others proved entertaining.

Moving pictures comprised a part of nearly every night program. These were obtained from the U. S. Department of Agriculture, projected with a machine furnished by the State Bureau of Entomology and displayed by District Foresters Story, Young and Thurmond in turn.

Camp Management

The management of the camp and arrangement of programs of entertainment and athletics were in general charge of M. D. Mobley, Tifton, Assistant State Supervisor of Agricultural Education. Everybody agrees that he is ideally fitted for the work he did. His assistants were agricultural vocational teachers who were as follows: J. D. Davis, Pavo, P. L. Elkins, Alpharetta, I. V. Chandler, Poplar Springs, L. E. Cox, Ellijay, J. W. Bolton, Waynesboro, J. H. Buckman, Statham, Guy Waddell, Stockton, C. F. Richards, Camilla, F. B. White, Barnesville and Carl O. Parker, Carnesville.

The conduct of the students was excellent. The comment of teachers and visitors was that they never saw a finer bunch of boys.

Illness or illness in families took from the camp three boys, Fred Harris of Rabun Gap; Clayton Cordell, Hartwell and Truett Drake, Adrian. These, it is hoped, may be able to complete their camp work next year.

GOOD WILL MESSAGES RELAYED AT FORESTRY CAMP

Vocational Forestry Camp Students Contest in Relay Race Carrying Messages to Blairsville, and Hiwassee, Receiving Messages in Return.

In a 34-mile relay race in which first and second vocational forestry students competed, messages were carried to the editors of newspapers at Blairsville and Hiwassee, each 8½ miles from Young Harris.

The messages carried to the editors and their replies are as follows:

Message to Union County

To the people of Blairsville and Union County—GREETINGS! From Rabun Gap to Tybee lights we have come representing the entire state of Georgia to hold a camp in your mountains.

Your cooperation with us for a successful camp has been splendid and we are grateful. We cannot soon forget the cordiality and hospitality with which we have been received. We shall not soon forget the beauty of the land in which you live.

We have been impressed by the mountains and the quiet valleys and the clear old streams and in our contact with them and with you some of us have garnered what they represent—strength, clearness of vision, and aspiration.

We regret that our camp will end in only two more weeks but when we go away we shall carry in our hearts only the kindness of thoughts for Union county and her people.

From Editor of North Georgia News
To the Forestry Officials in Charge,
and the Boys in Attendance:

Allow me to express to each of you a

heartily welcome in behalf of the citizens of Union county in your selection of the mountains of North Georgia as a place in which to conduct your studies for a three-weeks' period.

I am certain that the people of the mountains will cooperate with you in your worthy undertaking, and I trust that your stay here will be a pleasant one.

Especially do I thank the Messenger boys in bringing a message of good will to our people. May the work of Forestry in Georgia have the same co-operation from the people of the state as did this fine band of boys co-operate in bringing this message to me.—J. P. Davenport, Editor, The North Georgia News.

Message to Towns County

The Forestry Camp for vocational students extends greetings to Hiwassee!

Our appreciation of your county and its good people is deep.

We have thoroughly enjoyed our visit with you and our only regret is that we have only two more weeks of this delightful climate and inestimable hospitality.

Memories of this summer will long remain with us. We shall not soon forget the majestic, looming hills under whose cool, quiet shadows we sleep at night and in whose quiet coves we practice the principles of forestry during the day.

Some of us will return some day, some of us will not, but all of us from the other northern sections of the state, from the Piedmont and the Coastal Plain will have the most pleasant recollections of Towns county and her people.

From the Editor of the Hiwassee Paper

To the Students and Members of the Faculty at the Vocational Forestry Camp, WELCOME!

In expressing our pleasure and enjoyment in having you with us, we the people of Hiwassee and Towns county wish to say that we do indeed feel honored that you have made us this visit, and that you have chosen our lovely mountain section in which to spend your few weeks of study and recreation.

The summer months that bring you here are always the best months of the year to us, for we are always looking forward with thrilled expectancy to your visit.

We would like to have you remain longer with us, but since you must leave in a very short time, we are hopeful that the spirit of The Legend of Hiwassee, and the grandeur of stately old Bald Mountain will remain forever in your hearts and through the coming years will keep calling you back to us.



FORESTRY STAFF, VOCATIONAL TEACHERS AND WIVES

First Row—P. L. Elkins, Mrs. M. D. Mobley, Mary Mobley, C. N. Elliott, Jr., Mrs. W. G. Wallace, Mrs. Jack Thurmond, Mrs. W. D. Young, Mrs. H. D. Story, Jr., and daughter, Mrs. C. N. Elliott, Mrs. Guy Waddell, and daughter. Second Row—M. D. Mobley, W. D. Young, C. N. Elliott, I. V. Chandler, C. F. Richards, L. E. Cox, Guy Waddell, C. A. Whittle. Third Row—J. H. Buckman, Jack Thurmond, B. M. Lufburrow, H. M. Sebring, C. Bernard Beale, Bonnell Stone, J. W. Bolton, H. D. Story, Jr., W. G. Wallace.

DIVISION OF FORESTRY IN MARKET FOR TREE SEED

Teachers of vocational agriculture throughout the state have been asked by State Forester B. M. Lufburrow to have their students gather tree seed for use in planting the tree nurseries next season. The teachers are to canvass their schools and notify him early in September as to the quantity of seed to be expected from these sources.

Students will find this an excellent op-

portunity for picking up some ready cash this fall. A few schools made collections last fall and found the State Forest Service a satisfactory customer.

Further communications from the state forester to teachers are being sent out to encourage this cooperation.

Capt. I. F. Eldredge, New Orleans, in charge of the timber survey in the South was in the office of State Forester Lufburrow in August, conferring about plans for making a timber survey of Georgia.

CORN-PINE PLANTING EXPERIMENT PROMISING

Marion Renfroe, Quitman, Follows Suggestion Received at Forestry Association Meeting, Reports First Year's Results—Slash Pine Makes Rapid Growth.

Marion Renfroe, Route 2, Quitman, attended the annual meeting of the Georgia Forestry Association at Albany and heard Dr. Chas. H. Herty's proposition for some one to interplant young pines with corn to see what effect the cultivation would have on the pines. Renfroe took up the project and has written Dr. Herty the results.

The slash pine made astonishing upward growth. The longleaf, as one would expect, spent its energy in growing a tap root the first year and did not make much upward growth. The failure of longleaf to make marked visible growth, Mr. Renfroe thinks, may have resulted from too deep planting followed by sanding of the growth bud.

The letter reporting results was written June 21. The following is taken from the letter:

"I planted two acres of sandy loam in pines in eight foot rows, four feet in the row, on January 27, 1931. One acre was planted in Slash; one in Longstraw. The plants came from the State College nursery at Athens and all of them had frost-bitten tops when I received them. The Slash seedlings averaged about five inches over all in length; the Longleaf, about four inches over all. I got a 95 per cent stand in Slash, and 85 per cent in Longstraw.

"On March 20, 1931, I planted a row of corn between each row of pines. I gave the usual cultivation of corn to the pines and the corn four cultivations. Due to drouth and plowing my stand of Longstraw was badly sanded. I had planted them too deeply in the soil. I have a poor stand of Longstraw as a result. When I 'laid by', I planted a hill of Taneloxi soy beans between each hill of pine. These were not to harvest, but to keep down coffee weeds. I 'laid by' the first week in June. We had about three rains only from planting time to harvest.

"On October 19, 1931, I pulled out the corn in the regular manner. I produced 29.3 bushels of yellow corn weighed in. I charged all costs, from setting the pines to taxes on the land, to the corn. This amounted to \$7.83 or 27 per cent per bushel. I received 45 cents per bushel when I sold the corn this spring, or \$11.25. (I took a weight loss on storage.) The profit was \$3.42 in money net and my pines.

"I am following the same plan this year. I had hoped to get fertilizer and put 200 pounds per acre of a 11-11 potash acid phosphate home-mixed compound, but was unable to do it. The Longstraw are like



MARION RENFROE, Quitman
In Corn-Pine Planting Experimental Plots.

healthy collards now, but have shown little growth other than spreading. This is due largely to my planting them too deep and their consequent sanding in the buds, I believe.

"The Slash, as of today, June 21, 1932, average 48 inches in height and one inch in diameter 10 inches up from the ground. (Some individual specimen are 60 inches in height and 1½ inch in diameter). Some slash from the same seedlings set the same day, in uncultivated but protected land of the same sort, today average 24 inches in height and 3/8 inch in diameter. I am amazed and delighted. I am not ready, however, to make my conclusions yet, because the Longstraw were at a disadvantage through my error."

STATE PARKS VISITED BY LARGE NUMBERS OF PEOPLE

The two state parks which at present comprise Georgia's system of state owned recreational areas have been largely used this summer and have been visited by more people than ever before.

The Indian Springs Park in Butts county has been made accessible by improvement of the roads leading to it and has been made more attractive by the development work which has been done. The spring has been enclosed in a glass cover and covered with a substantial stone structure which makes it absolutely sanitary and greatly adds to its beauty. The ornamental trees and shrubs which have been planted during the two years have thrived and have been found to add to the attractiveness of the place. The one and one-half miles of trails winding through the forested portion have offered an inviting retreat during the hot weather and have been largely used by all types of people. A great many out of state tourists have stopped in passing through, and cars from a very

large number of states have been seen within the area.

The Vogel State Park on top of the Blue Ridge at Neel Gap has attracted its share of visitors also. The park is now equipped with a complete water system and modern conveniences, and offers some of the finest scenery and choicest mountain country to be found anywhere in the state. The park has within its boundary the summit of Blood Mountain, an elevation of 4466 feet, one of the highest peaks within the state. It is easily accessible from the highway over a well graded trail, and a climb toward the top is well worth the effort. The park also includes a beautiful waterfall at the headwaters of the Notally river which drops off of the Blue Ridge just north of its crest. Another waterfall is situated on the national forest just outside the boundary of the park. This fall has been made accessible by the construction of trails over two different routes, and attracts many visitors. The trail system has been located so that both long and short hikes may be made, there being several circular routes which enable the hiker to avoid retracing his steps and which keep him continually in new territory. The azalea and many fragrant flowers, some of which bloom continuously throughout the summer, have added much to the attractiveness of the area, and people are apparently beginning more and more to appreciate the beauty of the Georgia mountains. Excellent meals may be secured at reasonable prices at the tea room situated in Neel Gap, and accommodations are also available for a limited number of over-night guests. The period of transition from summer to fall which is now under way is a very interesting time to visit this area and as the fall progresses the foliage takes on more and more colorful appearance until it develops a color scheme which can not be excelled anywhere.

For those who like the great outdoors, these two areas which are owned by the state and administered by the Department of Forestry and Geological Development are available for use and will be found to contain much of interest, and it is hoped that more and more people will avail themselves of what these two state parks have to offer.

E.B. STONE, Jr.

FROM CALIFORNIA

Near Los Angeles a hawk seized a snake which was consuming a gopher, carried it aloft, struck a high tension wire over a forest area and electrocuted all three. The wire broke, fell to the ground and started a forest fire.—Service Letter (Pa.)

The many friends in Georgia of Bonne Stone sympathize with him in the death of his father, Prof. H. H. Stone, who for 50 years was a member of the faculty of Emory University and its branch, Emory Academy, at Oxford, Ga. He died August 18 at the age of 71 years.

FORESTRY QUESTION BOX

What is wood flour and how is it used?

Wood flour is finely ground wood selling at \$25 to \$50 a ton depending on the fineness of the flour. It is made from saw dust, shavings, slabs, edgings, trimmings and round wood, principally from white pine. Grinding may be done by stone burrs or steel burr roller mills similar to that used in grain mills.

About 30,000 tons of wood flour are used annually in this country. The chief demand is from manufacturers of linoleum. Some is used in dynamite and in producing radio dials and knobs, telephone parts, ignition blocks, radiator caps, handles, doll heads, picture frames, ten pins, bowling balls, phonograph records, brush backs, etc. Composition flooring is made with wood flour, sawdust and caustic magnesia cement. Wood flour is also used in making "oatmeal" wall paper. Numerous other articles might be mentioned.

What is the life of creosoted timber used in bridge construction?

The Lake Pontchartrain trestle of the Southern Railway in Louisiana was built in 1883. Engineers of the Interstate Commerce Commission examined it after 35 years service and estimated a total life of 70 years. Tests of timber taken from it after 45 years service showed them to have strength equal to that of new timber. Today, after 49 years the trestle is in excellent condition.

How much rayon is made in this country from wood?

The manufacture of artificial silk or rayon from cellulose began in this country about 20 years ago. In 1920 this country produced 9,000,000 pounds of rayon. By 1931 the output had reached 144,350,000 pounds, which is 30 per cent of the total production in the world. Practically all the cellulose used was obtained from wood, mainly red spruce.

Is there a difference between the Southern Red Oak and the Spanish Oak?

They are the same. Another red oak found in Georgia is the northern red oak but it is comparatively rare. The scarlet oak sometimes confused with the red oak is abundant in the mountains but rare in other parts of the state.

E. L. Demmon, director of the Southern Forestry Experiment Station with headquarters at New Orleans, spent two days last August in the office of the state forester, collecting forest data on Georgia. He is compiling information required by Congress about the status of forestry, the trend of land utilization and probable future timber production.

VOCATIONAL FORESTERS JOIN FORESTRY ASS'N

Georgia Forestry Association Welcomes Young Foresters to Membership by President Woolford and C. B. Harman, Chairman of Executive Committee.

All who completed the Vocational Forestry Camp Course at Young Harris on August 12, were invited by President T. G. Woolford of the Georgia Forestry Association to become members of the Association. C. B. Harman, chairman of the Executive Committee, has sent each of these students a certificate of membership in the association.

This action authorizing the boys to become members of the association was taken at Young Harris College on August 12. The camp graduates accepted the invitation enthusiastically. They were organized into a Georgia Vocational Forestry Club and on the payment of a nominal fee the entire membership of the club became members of the Georgia Forestry Association ready to promote the Association forestry program and to have a part in its annual meeting. All members of the club are entitled to receive the Forestry-Geological Review regularly.

SOME FACTS ABOUT LUMBER PRODUCTION

(Based on 1930 Report)

Softwood production was 21,322,786,000 board feet in 1930. The Pacific Northwest produced over 9 billion and southern pine belt over 6 billion. Oregon and Alabama led in respective regions.

Hardwood production by rank of states was Louisiana, Wisconsin, Mississippi, Michigan, Tennessee, West Virginia, Arkansas and Virginia.

Michigan was first in consumption of hardwoods. Other leading states were Pennsylvania, Ohio, Illinois, Tennessee and New York.

Tennessee led in per capita consumption of hardwoods with 106 feet; California used more softwood than any other state with New York second.

For the United States as a whole the per capita consumption of softwoods was 158 feet, a decrease of 32 per cent compared to 1928, and the per capita of hardwoods was 32 feet, a decrease of 33 per cent.

Prof. W. B. Bates, winner of the Georgia Forestry Association prize in 1931 for the best work done in forestry, has been transferred from Nashville to Waresboro.

Vocational Forester Certificate



Awarded by
DIVISION OF FOREST SERVICE

Department of
FORESTRY AND GEOLOGICAL DEVELOPMENT
of Georgia

This is to certify, that *Harry Seymour*

having made an acceptable record in Forestry in a Vocational Agricultural School, has now successfully completed six weeks of intensive work under trained foresters of the Department of Forestry and Geological Development of Georgia at the Vocational Forestry Camp, which certification affirms that the person here named has a knowledge of the fundamentals of Forestry Practices and is recommended as qualified to do non-technical forestry work.

In witness whereof, we affix hereto our signatures and official titles on this the 12th day of August, 1932.

Richard B. Russell Jr.
B. M. Lufkin
Carl White

Chairman, Commission of Forestry
and Geological Development

State Forester

Educational Manager

VOCATIONAL FORESTERS' CERTIFICATE

Miniature reproduction of certificate received by each student successfully completing six weeks' course in the Vocational Forestry Camp after completing work in forestry in Vocational Agricultural Schools of the State. Thirty-nine students received certificates at the close of Camp August 12, 1932. Recommends certificate winners as capable of doing a number of forestry jobs.

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Fourth District Office Moved

Through the efforts of the Muscogee County Board of Commissioners and Mr. R. H. Barnes, the office of the 4th District, W. G. Wallace, District Forester, was moved into the Muscogee county court house.

This office had formerly occupied space supplied by the Columbus Chamber of Commerce. It is felt that this change will enable the district forester to more efficiently conduct the work of the Department of Forestry and Geological Development in the Columbus district while still enjoying the cooperation always so graciously offered by the Columbus Chamber of Commerce.

Landowners in the Columbus district are invited to lay their forest problems before the district forester who will give all assistance possible in making the business of raising trees a more profitable one.

SIXTH DISTRICT

Jack Thurmond, District Forester
Savannah

Slash and Longleaf Seed Crop Promising

Although there are no indications of a bumper crop of seed from either slash or longleaf pines, indications point to a crop which should be above the average.

Anyone planning to gather seed from either of these trees should begin making preparation, for the slash cones will be turning brown and should be gathered before they release their seed. Slash pine cones should be taken from the tree in this area about September 15th and longleaf cones in this section should be gathered about October 1st.

If anyone has planned to gather tree seed of any kind it would be well worth while to get in touch with your nearest district forester so that he can give information about gathering, extracting, and storing the seed.

Fall Planting of Seed Beds

In District 6 planting of seed beds to slash and longleaf pine in the Vocational School Nurseries will be done in the fall of the year this season instead of the spring so that data may be obtained as to the best time to plant in this particular section.

For the past two or three seasons the beds have been planted in the spring but due to excessive dry conditions the school seed bed have not given satisfactory results, so this season as soon as each school gather sufficient tree seed the beds will be prepared and planted. In this manner we hope to produce better stock and also have some actual information regarding the best time of the year to plant seed beds.

SEVENTH DISTRICT

C. Bernard Beale, District Forester
Waycross

Okefenokee T. P. O. Gives Barbecue and Fish Fry

Over five hundred people from several counties attended the barbecue and fish fry given by the Okefenokee T. P. O. at Hamp Mizelle's lake on the edge of the Okefenokee Swamp on Labor Day.

The principal talk was given by Dr. Herty, who warned that before any pulp mills are located in Georgia, it would be necessary to have abundant suitable timber for pulpwood, and that fire must be controlled before timberlands can satisfactorily restock. Dr. Herty urged his hearers to give up the habit of burning the woods and join the T. P. O.'s in their efforts to keep fires out and grow crops of timber for pulpwood and turpentine. He described his work at the experimental plant at Savannah, and exhibited, much to the interest of all, samples of pulp made from slash, longleaf, and loblolly pines.

State Development Agent Bonnell Stone, State Forester B. M. Lufburrow and Alex Sessoms, Cogdell, participated in the program.

The meeting was thoroughly enjoyed, and much enthusiasm was afterwards voiced by those present in Dr. Herty's plan of growing pulpwood timber crops. Many made plans to try harder than ever to protect their lands this coming winter.

Waycross Kiwanis Club Adopts Forestry Program

A program of activities to promote forestry work has been adopted by the Waycross Kiwanis club. This program will embrace the following activities: (1) Home forestry project contest in the county schools. (2) Establishment of roadside demonstrations in planting and natural reforestation on principal highways. (3) Essay contest in city schools. (4) Distribution of pine seedlings to county schools planting one-acre plots. (5) Fire protection for land-owning members. (6) Work toward getting county to employ cooperatively with the state a county fire patrolman.

Suwanee T. P. O. Fire Crew Working on Primary Breaks

Under general supervision of W. M. Oeltmeier, forest manager, major fire breaks, 100 to 200 feet in width, are being constructed on Suwanee Forest in southern Clinch county by the Suwanee fire crew. Down logs and snags are being removed from the break and on each edge a hundred feet back. The undergrowth vegetation on the strip is being burned out, control furrows on each edge being plowed with a Hester single-disc.

An inspection of the work was recently made with J. M. Cameron, chief patrolman, and a thorough job is reported.

EIGHTH DISTRICT

H. D. Story, Jr., District Forester
Albany

Sealys Join T. P. O.

J. R. and C. S. Sealy listed 4,400 acres of land in Seminole county in the Flint River Timber Protective Organization. Mr. Sealy and son have been advocating fire protection and good forest management for some time. They are lumbermen and realize the need of protecting timber.

They have begun fire break construction. Mr. Sealy expects to list more land soon, believes his neighboring land owners are going to join the organization and he expects to see the day when all the southern part of Seminole county will present a solid front against wood fires.

STATE TREE NURSERIES

Both the state tree nurseries at Albany in South Georgia and Blairsville in Union county are progressing favorably. In view of the lateness of planting it is considered that the seedlings are doing remarkably well. The seedlings at Albany especially, had not developed very much of root systems when the extremely hot weather of midsummer struck them, but in spite of this adversity about three quarters of a million seedlings are now thriving and have gained about a foot in height.

Improvements are being made on the drives into and through the nursery and the general appearance of the grounds is being gradually improved.

At the mountain nursery the black locusts and black walnuts are doing especially well, having attained from a foot to 18 inches in height in August. The various pines are progressing fairly satisfactorily although they have been hindered by overflows and excessive rain.

TALKING PICTURE ON FOREST FIRES

A short talking picture entitled, "Forest Fires—or Conservation?" sponsored by the Forest Service, and designed for use during the fire season in the Northwest, has just been released by the U. S. Department of Agriculture. This film shows the Secretary of Agriculture, Arthur M. Hyde, presenting to Congressman Scott Leavitt, of Montana, a commission as a Volunteer Fire Warden in his state and presents Mr. Leavitt in a short talk on the importance of forest conservation, illustrated by various scenes exemplifying forest resources and the destructiveness of their arch enemy, fire.

This film, three-fourths reel in length may be obtained from the Office of Motion Pictures, U. S. Department of Agriculture Washington. No rental is charged, but the borrower is required to pay transportation charges.

CAMP VALEDICTORIAN PRAISES FORESTRY WORK

**Jim L. Gillis, Jr., Soperton, Spoke
Appreciation of Class Completing
Vocational Forestry Camp Course.**

At the closing exercises of the Vocational Forestry Camp, August 12, Jim L. Gillis, Jr., of Soperton, chosen by his class to speak their appreciation of the camp, made the following remarks:

When Georgia introduced forestry into her vocational agricultural schools, she was the first State in the Union to undertake such a plan. Whatever doubt there may have been in the beginning as to its success was quickly developed, for we are glad to say it has been a success. So much so that other States have adopted the Georgia plan.

It was a little over three years ago that the Forestry Department of the State approached the Vocational Agriculture Department of Georgia with the plan that is now in operation. It was realized that forestry and farming go together and that vocational agricultural schools should teach both. So it has come about that vocational forestry became a part of vocational school work. The plan of the Department of Forestry and Geological Development of the State called for school forests on which practical jobs in forestry could be carried on. All vocational schools of Georgia now have school forests which have been surveyed, and for which management plans have been made by the State Forest Service. The plan also calls for District Foresters to visit the school two or three times a year and conduct demonstrations. The Department of Vocational Education of the State, through the vocational agricultural teachers, has taken up the forestry project enthusiastically and both the Forest Service and vocational department have operated very harmoniously.

We, the vocational students, certainly appreciate the opportunity which these agencies have provided for the study of forestry in our schools and for attending the forestry camp. We vocational students greatly appreciate the training we have received in Tree Identification, Land Surveying, Forest Management, Timber Cruising, Wood Utilization, and other jobs. We have heard lectures in the class room and have then gone out into the forests to put into practice what we have been taught. We have not been taught technical but rather the practical side of forestry; I am sure I speak the sentiment of every boy in camp when I say our instruction has been very practical and helpful and we do not see how six weeks' training could have been better.

The training we have received we feel will result in better forestry practices on our farms and each of us should return to our homes determined to set an example to our community in proper protection and management of the forests on our farms.

We cannot say too much in praise of the Vocational Forestry Camp. We are very grateful to the Department of Forestry and Geological Development for providing the funds that made it possible to attend the camp, and the foresters who have done such good work in teaching us practical things about forestry. We are also grateful to the Department of Vocational Teaching for providing transportation to and from the camp, and for the splendid care given us while in camp. We will never forget the wonderful excursions conducted

both last year and this to the mountains, forests and wood working plants.

We all like athletic events and we are indebted to the Department of Vocational Education for the fine program of athletic events in which we have engaged.

Then, there are the night programs of spirited singing, instrumental music, lectures, and moving pictures that have added much to our enjoyment and instruction.

I am sure the boys here who have closed their six weeks' camp work will turn away from Young Harris College with a feeling of sadness that it will be all over, but the six weeks of vocational forestry spent here will, I am sure, always be held in memory as one of the most helpful, inspiring, and enjoyable of our lives.

FOREST FIRES SHOW DECREASE ON PRO- TECTED LANDS IN 1931

**More Than 87 Per Cent of Acreage
Burned Was in Unprotected Areas
—Damage \$67,000,000.**

Forest fires in the United States were slightly less prevalent in 1931 than in 1930, according to the United States Forest Service's annual summary of reports and estimates from the States cooperating with the Federal Government in forest-fire control. Fires last year numbered 186,894; in 1930, 190,980 were reported. Area burned over decreased by 688,150 acres—from 52,266,460 acres in 1930 to 51,578,310 in 1931.

An important gain of the year was in holding forest fires to smaller average size in protected areas in the Northeastern, Middle Atlantic, Southeastern, and Gulf States. The average area per fire in all protected areas, however, was 103 acres, somewhat larger than usual.

Areas in the United States under some form of organized fire protection aggregated 400,749,510 acres last year, about two-thirds of the total acreage needing protection. On these areas, 61,854 fires burned 6,378,340 acres in 1931. Of the total area of all classes burned over last year, 45,199,170 acres, or more than 87 per cent, was on unprotected land.

Incendiarism was responsible for 24.9 per cent of the protected area burned last year, in contrast to an annual average of 17.1 per cent for the 1926-30 period. Incendiarism in 1931 numbered 15,427, against an average of 7,638 for the five-year period—an increase of 101 per cent. Sharp increases in incendiarism were noted in the Southeastern, Gulf, Central, and Pacific States, although State, Federal, and community efforts controlled the situation better in the latter part of the season.

Carelessness of campers and smokers took a heavy toll. In the protected areas alone, the year shows a record of 5,236 campers' fires, against a five-year average of 3,525, or an increase of approximately 50 per cent. Forest fires from smokers in

protected areas also increased, with 14,488, against a five-year average of 9,408.

Set against these records of human carelessness and wrongdoing are decreases of one-fourth in railroad fires, one-third in lumbering fires, and more than one-tenth in lightning fires. Debris-burning fires and fires from miscellaneous and unknown causes increased.

The Forest Service summary shows that forest fires damaged protected areas to the extent of approximately \$17,018,100 in 1931. The damage to unprotected areas, according to incomplete estimates, was placed at \$50,069,060, making a total forest-fire damage of more than \$67,000,000 for the year, taking into account only tangible losses and not including such losses as scenic values, wild life, watershed values, etc.

In addition to protecting the national forests, the Federal Government is now cooperating, under the Clarke-McNary law, in the protection of some 200,000,000 acres of State and privately owned lands. The money used for cooperative protection of State and privately owned lands in 1931 amounted to \$7,216,885. Of this amount, the States furnished \$3,839,305; private owners, \$1,844,638; and the Federal Government, \$1,532,942.

Altogether, 617,290,490 acres in the United States need fire protection, the Forest Service estimates. About 35 per cent of this area is without any organized protection.

FOREST TAXATION

The Timber Conservation Board appointed by President Hoover stated in its report the following on forestry taxation:

"The present and prospective annual burden of taxation on mature standing timber is the most important single present factor forcing the sale and cutting of timber without due regard to the current market demand for forest products.

"The present and future security of private ownership of merchantable standing timber as well as the maintenance of reasonable current balance between production and consumption of forest products requires the substitution, in the principal timber states, of an equitable system of income or yield taxation for the present prevailing system of property taxation."

TREE SPOUTS WATER

A spouting tree! Who ever heard of one? A large balm over 250 feet tall standing in Beaver park, east of Oregon City, actually spouts water. ~~Just 11 feet from~~ the ground, water continually gushes from the apparently sound and healthy tree. There is not a dead limb or twig on the entire tree.

On several different occasions water has shot eight feet straight out from the balm and a very noticeable gushing noise is evident.—The Forest Log (Oregon).

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

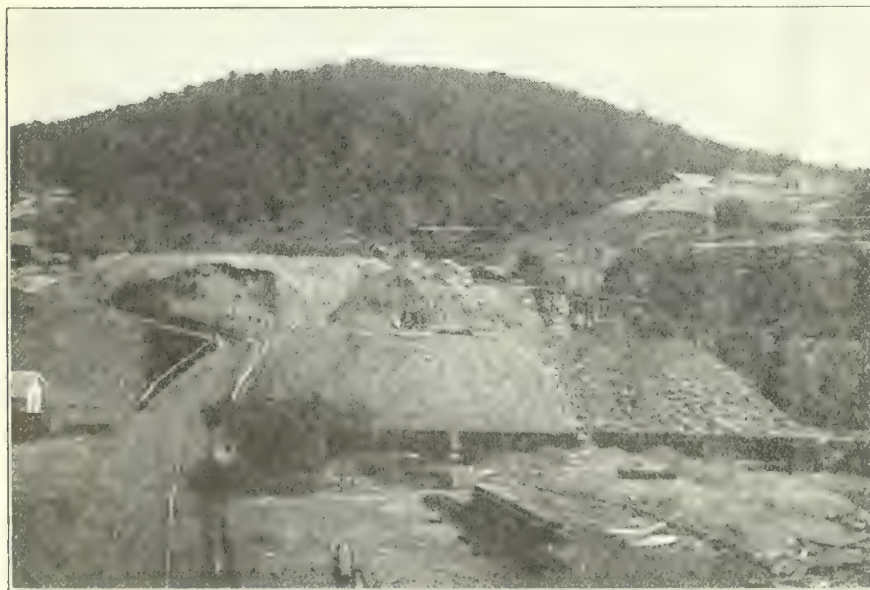
COAL DEPOSITS OF GEORGIA

The coal deposits of Georgia are confined to Lookout, Sand and Pigeon mountains, which are located in the extreme northwestern part of the state in Walker, Chattooga and Dade counties. The deposits in Walker county occur in Pigeon Mountain and along the eastern side of Lookout Mountain. The most valuable coal seams in this county appear to be on the property of the Durham mines. These mines are located on what is known as Round Mountain, a small elevation located near the central axis of Lookout Mountain. Round Mountain, as the name suggests, is a nearly circular mountain having an area of several hundred acres and an elevation of about 300 feet above the surface of Lookout Mountain.

The deposits of Chattooga county are limited to a small area in its extreme

workings, there has also been a limited amount of coal mined near Rising Fawn, in the southwestern part of the county, only a short distance from the Georgia-Alabama line.

The geology of the coal fields of Georgia is quite simple. The ocean covered this part of Georgia throughout the long ages known as Paleozoic time. Limestones and shales were deposited during the first part of this era, but during the Carboniferous era the deposits were of sandstone and conglomerates with occasional shale beds, and at times enough land emerged for vegetable matter to accumulate in low-lying swamps, perhaps similar to our Okefenokee swamp. It is this vegetable matter that has formed our coal deposits. At the end of the Paleozoic this part of the state emerged from the sea and in the eras that followed has never been again submerged. The forces



Durham Land Company's Coal Mine in Northeast Georgia.

northwestern corner along the Georgia-Alabama line. The exposures of coal here, as in Walker county, are near or on the eastern brow of Lookout Mountain at an elevation from 500 to 600 feet above the valley. This county, so far, has produced no coal, but nevertheless there are a number of places where promising exposures occur.

The coal area of Dade county exceeds that of any other county in the state. The deposits are confined to the western side of Lookout and the northern portion of Sand Mountain. The main coal mines of this county are on Sand Mountain in the vicinity of Cole City. In addition to these

that thrust up the Appalachian mountains out of the Piedmont Plateau exerted a strong lateral pressure from the southeast that thrust these flat-lying beds into huge folds. Later erosion has worn through the sandstones at the crests of the folds, exposing the more easily eroded limestones. The streams have since worn deep valleys in these limestones in what were the crests of the folds, while the sandstones with their thin beds of coal that were preserved in the troughs of the folds now form the flat-topped Cumberland mountains, known in Georgia as Lookout, Pigeon and Sand mountains.

The total coal area in the state is ap-

proximately 170 square miles which is estimated to have originally contained 933,000,000 short tons of coal. About 12,600,000 tons of coal have been mined to date, leaving still in the ground a total of 921,000,000 tons.

The first coal mines opened in Georgia were on Sand Mountain at Cole City, in Dade county, more than 60 years ago. Other mines were opened later at Round Mountain in Walker county on Lookout Mountain. The only coal mines in operation in the last 15 or 20 years have been mainly those of the Durham Coal and Iron Company, now the Durham Land Company, at Round Mountain on Lookout Mountain about 18 miles south of the Tennessee line. The coal from these mines is semibituminous, has a high heating value and is largely used for steam and coking purposes. Its character is shown by the following analysis by the U. S. Bureau of Mines on a sample of Durham coal delivered to a government building at Rome, Georgia:

Analysis of Coal from Durham, Georgia

Moisture (as received).....	1.2%
Volatile matter (dry)	21.2
Fixed carbon.....	75.7
Ash	3.1
Sulphur	0.6
British thermal units (dry).....	15,220
Ash fusion point.....	2,650° F
Specific gravity	1.33

The production has come principally from two seams, each two feet or more in thickness, although small amounts have been mined from other seams. The outcrops of these seams are about 100 feet apart and are 1800 to 2000 feet above sea level. Most of the mining has been done by pick and shovel, with the aid of blasting and compressed air drilling. Some coal along the outcrops has been stripped and mined in recent years by steam shovel.

Detailed information on the coal deposits of Walker, Dade and Chattooga counties is given in Bulletin Number 12, issued by the State Geological Survey. This publication can be obtained from the State Geologist upon payment of postage, ten cents.

The Shenandoah National Forest in Virginia has been renamed and is now the George Washington National Forest.

An appropriation of \$500,000 is now available for the construction of roads and trails in the Great Smoky Mountain National Park.

Twenty Houses to a Tree

The Governor Stoneman Sequoia tree in the South Cavaleras grove in the Stanislaus National Forest in California is so big that it could yield enough lumber to build twenty 5-room bungalows—179,000 board feet, says the Forest Service. The larger limbs are six feet in diameter.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 2

ATLANTA, GA., OCTOBER, 1932

No. 19

FORESTRY DIVISION JOINS IN COMMUNITY PROJECT

Area of Old Milton County Selected for Agricultural, Educational, Social and Natural Resource Development.

A movement originating in Washington and fostered with federal appropriation for demonstrations in community improvement, is being promoted by the Board of Regents of the University System of Georgia, and steps have been taken to operate on the Old Milton county section of Fulton county as the first unit.

The Division of Forestry was invited to participate. State Forester B. M. Lufburrow assigned to District Forester W. D. Young the task of making a timber and land classification survey of that section as fundamental to launching a forestry program. Mr. Young, District Forester H. M. Sebring, District Forester W. G. Wallace and Eitel Bauer, Superintendent of Tree Nurseries, made a survey in September. The survey will show land in forest, types of forest, available commercial timber, area restocking and areas that should be reforested as unsuited to agricultural crops. A fire control management plan for 92,000 acres will be made. Also marketing and thinning will be conducted.

Recently vocational agricultural teaching was introduced in the Alpharetta school. P. L. Elkins, teacher in charge, is planning to teach forestry in his courses, and will have a school forest which the district forester will survey and for which management plans will be made. Through Mr. Elkins and the county agent the district forester expects assistance in carrying on the forestry development work of the county. Other contacts will be made as the work progresses.

More than 155,000 acres of land were planted to trees in 1931, Michigan being first among the states with 47,264 acres.

Russia has 21 per cent of the world's timber, or about 950,000,000 acres of timberland. Soviet development of these timber resources is influencing timber prices in other timber producing countries.

GEORGIA FOREST FIRE DATA (Record 1931)

Total acres needing protection.....	23,582,000
Acres protected.....	1,989,980
Percent protected.....	8.4
Percent protected area burned	
1931	2.02
Average acres per fire.....	71.1
Acres unprotected	21,592,340
Percent unprotected	91.6
Number of fires.....	22,690
Acres burned over.....	6,240,780
Damage by fires.....	\$6,864,840

Causes of fires on protected areas: Lightning 28, railroads 32, campers 30, smokers 13, debris burning 15, incendiary 245, lumbering 37, miscellaneous 64, unknown 102.—Total 566.

Number of fires by size on protected areas: Under $\frac{1}{4}$ acre, 15; $\frac{1}{4}$ to 10 acres, 165; over 10 acres, 385.

Number of fires on unprotected areas, 22,690; acres burned over 6,240,780; damage \$6,864,840.

Damage to protected areas \$7,410; to reproduction on protected areas, \$50,870; total damage to protected areas \$58,280; average per acre of protected land \$1.45.



HARRY SEYMOUR, Bowman, student Georgia Industrial College, first honor student of Vocational Forestry Camp, with highest average grade for two seasons. Harry's ambition is to become a research chemist on cellulose of wood.

PLANTING FOREST TREES FALL OR SPRING SEASON

State Tree Nurseries Ready to Supply Planting Stock as Long as Supply Lasts—Active Demand.

Those who desire to reforest lands that are not naturally reproducing desirable species of trees, can obtain seedlings suitable for planting from the State Forest Service headquarters in the state capitol at Atlanta. The planting stock offered by the forest service has been grown at state nurseries located at Albany in South Georgia and Blairsville in the mountains of North Georgia.

At Albany, slash, longleaf and loblolly pines have been grown. At Blairsville, black locust, walnut, loblolly, shortleaf pines and black walnut have been grown.

Seedlings for planting are offered at a lower price this season than ever before in Georgia. They are grown with funds provided from state and federal sources for the purpose of supplying planting stock at cost to Georgia land owners.

Cost of Planting Stock

The prices at which tree seedlings are offered by the State Forest Service this season are as follows:

- Slash pine, \$1.50 per thousand.
 - Longleaf pine, \$1.50 per thousand.
 - loblolly pine, \$1.50 per thousand.
 - Shortleaf pine, \$1.50 per thousand.
 - White pine, \$1.50 per thousand.
 - Yellow Poplar, \$3.00 per thousand.
 - Black locust, \$2.00 per thousand.
 - Black walnut, \$3.00 per thousand.
- The shipments are sent express collect.

How to Plant

In old fields no longer needed for agricultural crops and not naturally reforesting or coming back to desired species, tree planting is essential to proper reforestation.

In the southern half of the state seedlings may be planted either in the fall or early spring. In the northern half of the state spring planting is preferred.

One can get a supply of seedlings from state or commercial nurseries or use wild

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.....Gainesville

H. M. Sebring, District Forester.....Macon

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W. D. Young, District Forester.....Rome

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seedlings growing in or near forests in the community. If purchased from nurseries the plants should be moistened as soon as received and kept moist until they are put into the ground. Dried out roots, especially of pines, are likely to cause the plants to die.

If wild stock is to be planted, use only one or two-year-old seedlings. Spade them up carefully so as to maintain the root system intact and so as to retain soil on the roots as much as possible. Place the seedlings in buckets of water and keep them there until they are transferred to their permanent planting places.

If plantings are to be made in old fields, it is well to plow two or three furrows to establish planting rows. These rows may be made 6, 8 or 10 feet apart. The wider planting is desired for slash and longleaf pine to be grown for naval stores. The distance between plantings in the row may be the same distance as that between the rows.

All pines except longleaf may be set in the ground at practically the same depth they were in the nursery bed or in the woods, if obtained therefrom. The longleaf should be planted so that the seedling will be about an inch higher than it was when taken up for planting. This is to reduce the danger of shifting or blowing sand getting into the bud. Nor should a longleaf especially be planted in the bottom of a water furrow, but on the side of it to avoid sand injury.

Various tools may be used for digging holes. Care should be taken to make holes deep and broad enough to avoid turning the tap roots or cramping the

lateral roots. The replaced earth should be tramped firmly around the plant so that no air pockets remain in and around the seedling roots.

Keep out fire. Do not let livestock graze the land till the seedlings have grown large enough to escape trampling.

If plantings are to be made in open places in forests and in rough lands where it is not practical to plow, spots should be cleared of vegetation and then dug up. In the center of these spots, plant seedlings as described above.

In planting walnut trees, the distance between plants should be wider than in planting pines or black locust, anywhere from 10 to 20 feet.

Anyone desiring fuller instructions about planting may obtain the same by writing State Forester B. M. Lufburrow, 425 State Capitol, Atlanta, who will send bulletins on the subject.

GORGEOUS FALL FOLIAGE OF GEORGIA FORESTS

Trip to Vogel Park in Mountains Affords Panorama of Rich Coloring of Great Variety of Trees Arrayed on Mountain Sides.

To many the forests are most attractive in October and November as the touch of autumn transforms the green of the trees into a riot of rich colors. Every species of tree makes its exit for the season with a different flare of color, so that one versed in leaf colors can make a fairly accurate survey of species, especially in the mountains where the slopes bring great areas into view.

Those who would see autumn in all of its outdoor glory should take the Appalachian Scenic Highway to Vogel Forest Park on the crest of the Blue Ridge in Georgia, varying the trip by a return through Dahlonega, or by Blairsville, Hiawassee, Clayton and Cornelia.

Those who visit Vogel Park at Neel Gap will find it delightful to leave the automobiles and take foot trails to the various lookouts, waterfalls and other points of interest. A tea room is operated at the park and all conveniences for comfort and rest are available.

Not only Vogel Park, but Indian Springs Park in middle Georgia welcomes visitors in quest of autumn beauty and rest. Both are equipped to care for hundreds of visitors. The state has provided these recreational parks for the people of Georgia and visitors from elsewhere. The best way to demonstrate to the state authorities that people appreciate these recreational provisions is to visit and enjoy them. How about a fall foliage exploration to one of the state parks?

The state forest nurseries of this country distributed more than 100,000,000 trees as planting stock in 1931.

FORESTRY QUESTION BOX

What is the oldest broadleaf tree that now survives?

The Ginkgo tree is considered the oldest broadleaf species. Its remains are found as fossils in rocks indicating greater antiquity than any other broadleaf. It exists in Georgia mostly in ornamental plantings.

The leaf of the ginkgo is fan shaped with no visible veins. Four or five leaves emerge from buds on the branches. The edges of the leaves are smooth on the sides while the upper edge of the fan is irregular but not definitely notched. Trees of this species in Atlanta and nearby have attained diameters of six and eight inches. It is a unique and beautiful ornamental tree and is sometimes called the "Japanese Tree."

What is the name of the tree that has its seed in a cotton-like boll?

The name of this tree is Paulownia. It is commonly called "cottonwood tree" because of its bolls with their content of cotton-like fibre, but the true cottonwood is an entirely different tree belonging to the poplar family. The Paulownia belongs to the figwort family and is the only representative of this family growing in Georgia. It is sometimes mistaken for the catalpa because of the similarity of leaves. The catalpa produces seeds in bean-like pods. The Paulownia was named from Princess Anna Paulownia of Russia.

Does the Gopher tree grow in Georgia?

It has been found growing in the mountains of North Georgia. It is also called "Yellow wood." From the wood of this species of tree the Ark of the Covenant was made. Trees of this species have been found in the southern Appalachian mountains with diameters 12 to 18 inches and with height 75 to 100 feet. It is very rare, but apparently native to the region.

Will the White Pine grow in the Piedmont Region of Georgia?

The White pine is growing successfully in the Piedmont section of Georgia. Most of the plantings have been made in park and lawns. This species of pine makes comparatively rapid growth.

STATE FORESTERS MEET

The annual meeting of the Association of State Foresters will be held October 18 and 19 at Trenton, New Jersey. Following the meeting at Trenton the foresters will make inspection tours, an opportunity being given to visit and study forests and forestry work in New York.

The Jackson Lumber Company has turned over to the Forest Service of Alabama a tract of 5,000 acres in Geneva county for demonstration purposes.

SUMMARY VOCATIONAL FORESTRY SCHOOL WORK 1932

Practically Every White Vocational School in State Has School Forest and All Present Subject of Forestry.

A compilation of reports of forestry work in vocational agricultural schools of the state for the school year 1931-32 has been made by the Educational Manager of the Department of Forestry and Geological Development. The facts developed are given herewith.

Ninety vocational agricultural schools made reports on their forestry work.

Only two white schools of the state did not have school forests. One of these gave a very satisfactory reason for not having one.

All white vocational agricultural schools in the state presented the subject of forestry.

Approximately 2,500 high school students took work in forestry during the school year 1931-32.

Fifty-eight schools gathered tree seed and forty-four schools established tree seed beds for growing planting stock.

Fifty-five schools planted seedlings on the school forest, or lands near the schools.

All schools built firebreaks where school forests required them for protection.

Many of the schools have done all the thinning called for in the school forest management plans. Most of the others did some thinning.

Nearly all school forests have quarter-acre sample plots, one of which is burned over annually and the others left unburned. All trees on these sample plots are tagged and a record is made annually of the diameter growth of each tree.

In order for a student to qualify as a contestant for a camp scholarship, he must have a home project in forestry. This has encouraged the movement for home forestry projects with the result that there were 601 students who practiced planting, thinning, and firebreak construction on areas averaging three acres each on their home farms.

Each student gathers forest fire statistics in his school territory. Most of the schools are rural consolidated schools drawing students from a large territory. The area burned over and the cause of each fire are reported and are used by the State Forester in his compilation of fire statistics of the state. The fire statistics of the schools are not yet complete.

Each year some schools give up vocational agricultural work and others take it up. When a school ceases its vocational agricultural work, the forestry project at that school automatically ceases. The forestry service has, therefore, surveyed and established some school forests over the state that are no longer operated.

INOCULATING TREES TO PRESERVE CUT TIMBER

The University of California has developed a promising method of treating trees before cutting so as to prevent attacks of insects and fungi after they have been felled.

The material used for inoculating the standing tree that is to be felled is an arsenic and copper compound. The liquid is fed by gravity into holes made in the tree and is carried with the sap to all the sapwood of the tree. It takes about 24 hours to treat a tree. After this the tree can be felled. Insects and fungi lay off of the wood thus treated.

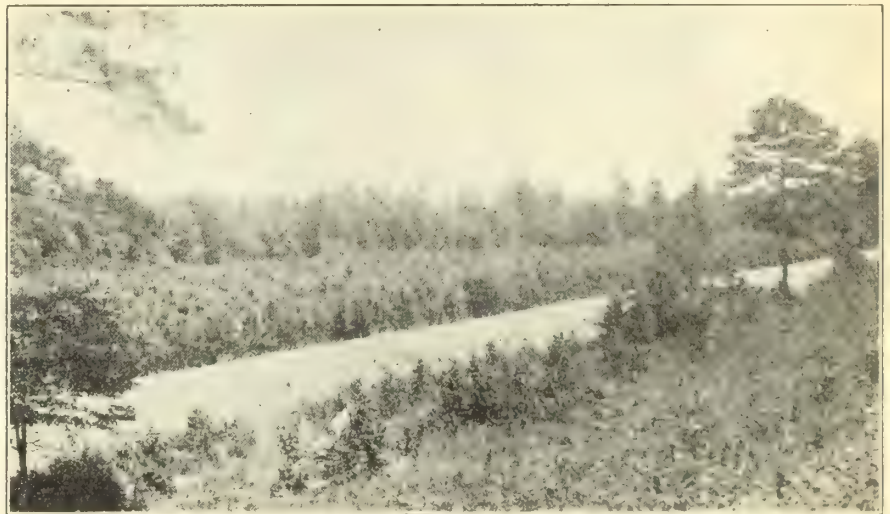
"The output of southern forests and woodworking industries, with an annual value in excess of \$1,000,000,000 in normal years, is more than the annual value of the products of southern textile mills". —Manufacturers Record.

GEORGIA AND HER RESOURCES

The Year Book issued by the State Department of Agriculture of Georgia appeared during September, and is a very creditable presentation of the agricultural and natural resources of the State. In the introduction, Hon. Eugene Talmadge, Commissioner of Agriculture, speaks of Georgia's bicentennial, refers to this state as having great resources and fascinating history and dedicates the publication to the farmers of the state.

A historical sketch of the State is followed by an account of Georgia's farm products, its manufacturing industry, its cities, mineral wealth, vast forest resources, its fish and game; of how aid is rendered the state's farmers; its schools and colleges; its "golden isles" along the coast; paved highways; a tribute by Ex-Governor Chase S. Osborne of Michigan, and statistical data by counties, etc.

The illustrations are numerous, well selected and beautifully displayed.



HOW PINES DO GROW!

ABOVE: Photograph of loblolly pines taken May 18, 1926, by State Forester B. M. Ledbetter, on Highway No. 27, Lumber City to Hazlehurst, south of Ocmulgee river. BELOW: Photograph taken by the state forester on the same spot September 6, 1932. The picture was taken from the rear of the Southern Railway. Believe it or not, it is exactly the same view.

ITEMS FROM GEORGIA VOCATIONAL FORESTERS CLUB MEMBERS

J. C. Ellington, Oxford, Ga., who completed the vocational forestry camp work and is now a student of Lees McRae College at Bonner Elk, N. C., recently reported a forest fire in North Carolina, joined the state forestry crew, fought fire all night, made firebreaks and got the fire under control. He writes that he was making use of his training at the forestry camp.

Broadus Orr, Walker Park, a student of the Vocational and Trades School at Monroe, writes: "I certainly appreciate what the Georgia Forest Service has done and is doing for us, especially the educational department for giving us valuable training at the forest camp for the past two years."

Bill Seaman and Arthur Steedly, Waycross, Horace Ayres, Carrollton, Harry Seymour, Bowman, and Henry Dean, all forestry camp students, made an enjoyable excursion into Okefenokee swamp the latter part of August and first of September. Fishing was good but their quest for bear was unsuccessful. All attended the forestry barbecue of the Okefenokee Timber Protective Organization September 5th and heard Dr. Herty's talk. The group contained members of the committee to select a design for the club badge. Their committee agreed upon a design and reported through Mr. Ayres to the educational manager in Atlanta.

"I want to thank you and all others who have made it possible for me to have this wonderful opportunity," writes Carson Britt of Snellville, about the forestry camp.

"I am just as proud of my certificate as I am of my high school diploma. I want to congratulate the department on having such a splendid team of foresters. I enjoyed all the courses very much both this year and last. I will do my best to pass the information I have received on to the people of Wilkes county."—George Garrard, Washington.

"I enjoyed the camp more than I can tell. I think the forestry camp is the most wonderful institution for vocational boys I have ever been connected with."—Howard Carlan, Commerce.

"I want to tell you how much I enjoyed my two summers, or the six weeks I spent at Young Harris. I had a fine time, saw lots of things I had never seen before, learned a lot about forestry and enjoyed myself lots in every way. I think all the forestry men are fine and don't think there is another bunch of men who could take their places."—William Johnson, Hogansville.

WINNERS IN CAMP ATHLETIC EVENTS IN 1932

The athletic events of the vocational forestry camp, July 25 to August 15, 1932, were well organized by Prof. J. D. Davis, vocational teacher of Pavo, Ga.

The list of winners of the various events is as follows:

100-yard dash—Joe Adams, Macon.

220-yard dash—Joe Adams, Macon.

Broad jump—Marvin Lloyd, Chamblee.

High jump—Tie: Bill Crosby, Sale City, and Marvin Lloyn, Chamblee.

Shot put—Clark A. Rogers, Ellijay.

Hurdles—Ulysses Carlan, Commerce.

Baseball throw—Ulysses Carlan, Commerce.

440-yard dash—Julian Royal, Screven.

Pole vault—Julian Royal, Screven.

Relay race—Winning team: Joe Adams, Macon; Bill Crosby, Sale City; Ulysses Carlan, Commerce; J. E. Noland, Decatur; this was a team of first-year boys.

Tennis (doubles) was won by Herman Braddy, Pavo and Julian Smith, Ludowici.

The cross country race of 17 miles was won by the second-year group.

The contests between first and second-year boys was close. The second-year boys scored 96 points and the first-year boys 87, the difference between the two being only 9 points.

A BLEEDING TREE

A strange tree grows at the foot of the Acropolis of Athens, Greece. It attains maturity in about two months after the shoot appears above ground, making very rapid growth. In a short time after starting growth branches are put forth, upon the tips of which appear sponge-like growths. At maturity the tree is a mass of crimson blossoms from which drop a bloody liquid. When all the blossoms drop, the blood-like sap ceases to drip and the tree dies. It is called the "tree of destiny," but available information does not tell why.

A process has been worked out in England whereby a ton of sawdust can be made to produce 35 to 40 gallons of alcohol—not "wood alcohol" nor "stump liquor." In the process the sawdust is converted into molasses and the molasses treated with yeast.

About 1,750,000 tons of wood pulp and 1,250,000 cords of pulpwood are imported into this country annually. Of the imported wood pulp, about 50 per cent comes from Europe where a large percentage of it is made from mill waste, whereas, in this country, large quantities of material suitable for pulpwood are left to rot in the woods.

SLASH PINE GROWTH IN MIDDLE GEORGIA

In 1930, District Forester C. N. Elliott planted 600 slash pines on the Ellington farm in Newton county for experimental purposes. Half were planted in bottom land and half on a hillside.

Growth measurements were made of a number of representative trees on both the lowland and the hillside. The average height of the lowland trees in August 1932 was 19.30 inches and on the hillside 11.98 inches, a difference of 7.32 inches in favor of the lowlands. The growth in 1932 on the two areas was only .95 of an inch, the lowland growth in height being 5.97 inches and the hillside 5.02.

In 1931 there was a severe drouth, which gave the low moist land the advantage. But in 1932 the season was comparatively normal and as a result, there is little difference in growth of the two areas.

These trees will be measured annually to determine the rate of growth of this south Georgia pine in middle Georgia.

JAP BEETLE TRAPS

One of the most dreaded insects of the orchardist and forester is the Jap Beetle. The Bureau of Plant Quarantine of the United States Department of Agriculture has put out nearly 60,000 beetle traps this year, covering a territory from Florida to Ohio to New England. The traps are moved gradually northward as the season advances.

These traps are detectors of the presence or spread of the insect, but are found to be effective in controlling it where it has been found in damaging numbers. Entomologists find that the Jap Beetle has a distinct preference for a green and white trap and for geraniol as a bait.

PROTECTING TURPENTINED TIMBER FROM INSECT AND FUNGUS INJURY

Prevention of insect and fungus damage to turpented timber through dry or burned faces has been the object of experiments by Haynes Huggins, woods superintendent of a southern Alabama lumbe company. Mr. Huggins believes that wood which is sealed over by a coating of gum is safe from attack by insects or fungus. It is known that the turpentine beetle, for example, will not attack fresh faces, concentrating its work on exposed wood. Three or four new streaks on the face will usually result in a sufficient flow of resin to provide effective protection until the tree is cut.—Forest Worker.

The Central States Forestry Congress will hold its annual meeting at Louisville November 17, 18 and 19. W. E. Jackson, Jr., State Forester of Kentucky is secretary.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

Burke County T. P. O.

Approximately 32,000 acres have been signed up in the Burke County Timber Protective Organization. Burke county has shown so much interest and so much enthusiasm in this project that this area is only a small beginning of what the landowners expect to do. Vestal Lumber Company, of Sardis, under the direction of Mr. L. H. Shaffer, is offering their co-operation in signing up approximately 30,000 more acres for the T. P. O. in that section of the county. The land which has been signed up belongs to the large landowners, and is, at present, scattered, but this is gradually being blocked in by the smaller landowners who are joining this organization. The movement seems to be on a county-wide plan.

Hart County Organization

The plan devised this spring to form an organization in Hart county in which each vocational boy of the county is to act as patrolman in the district in which he lives has been augmented by the Forest Protection and Improvement Association Contract. It is thought by the teachers of the vocational schools in Hart county that practically every landowner and tenant will sign one of these contracts in which he pledges to assist his neighbor in reporting and fighting fires. Aided by the school boys and the vocational teachers, this program should be a success.

Nancy Hart Memorial Park

Two large, handsome stone markers have recently been placed at the entrance of the Nancy Hart Memorial Park in Elbert county. A road has been built through the park which lies around the old home site of Nancy Hart. The thinning which is practically completed, was done by the vocational forestry students at the Nancy Hart Memorial School at Portsonia. Mr. F. M. Young is the teacher at the school. The boys plan to complete the thinning project this fall.

Two New County Agents

Two counties in District 3 recently acquired county agents who have promised their support and their interest in any work undertaken in the counties by the Division of Forest Service. Hoyt McConnell, of Richmond county, a brother of Bright McConnell, recently became county agent of Warren county. Jones Purcell, formerly with the Georgia Railroad Agricultural Department is the new county agent of McDuffie county. Mr. Purcell succeeds Mr. McGhee, who is at present county agent of Taliaferro county.

SIXTH DISTRICT

Jack Thurmond, District Forester
Savannah

Down in McIntosh county, near Meridian, within a few miles of the coast, is a unique turpentine still, owned and operated by Tom Pissismises, who came from Greece to this country and proceeded to go into the naval stores business in his adopted land.

This unique still will produce the three higher grades of rosin, namely, "X," "W.W.," and "W.G.," if the gum is produced in the absence of fire. This still operates much on the same order as the larger steam stills. The gum is put in a large boiler and heated with steam, is then strained through a screen and is run off into a storage tank lowered in the ground. The cleaned gum is then run from the storage tank over into the distilling basin and the spirits are there collected leaving the rosin to be drawn off much in the same manner as an ordinary fire still, but is a producer of real high grade rosin. Although the output is not great, the quality of the product is high.

Plowing Fire Breaks in Railroad Right of Way

During the week of September 12, the Central of Georgia Railroad conducted a demonstration in fire break construction with a caterpillar tractor and five disc Hester plow. The demonstration was put on by the Georgialina Tractor Company of Augusta.

Each year the railroad undertakes to burn a fire break along each side of their right of way but without any plowing to control their fires many of them get away and burn over timberlands belonging to private landowners. In addition sparks from the locomotives start fires along the right of way which spread to adjoining lands if no fire break is constructed and especially if no plowing is done to control the fires.

If all the railroads would plow a break along each edge of their right of way and burn the intervening strips out it would make a good fire break and is cheap to construct. The Hester fire break plow will plow a clean furrow 8 to 9 feet wide which gives plenty of protection in burning back to the tracks. The demonstration was a success from every angle.



Central of Georgia plowing a fire break to control right of way burning. Tractor on left, railroad train on right.

Contacting Colored People in Fire Protection

A good percentage of the population of the turpentine belt is made up of colored people and about the best way to get the message over to them about keeping fire out of the woods is to meet them at their schools and churches or any other gathering place and gain their confidence and then tell them in a few simple words just what the timber means to them and how they can help in protecting it from fire.

Recently at a funeral of a colored child, the District Forester spoke to several of the brethren and told them that the child lived and grew much the same as our young pine trees, that fever burned the body and caused the child to die and that fire burns the trees and they die also. They seemed to be impressed and expressed their desire to help keep the woods from burning off each year.

EIGHTH DISTRICT

H. D. Story, Jr., District Forester
Albany

Protection Work of Reynolds Bros.

Reynolds Brothers are beginning fire protection work on Pine Island T. P. O. by having a complete and detailed map made of the area locating all fire breaks, streams, and roads and will begin plowing fire breaks in October. They are planning on putting in burned fire breaks along the principal roads, connecting these up by permanent plowed breaks.

Pine Island T. P. O. is planning more intensive protection for the year and with their system of tenant as well as special patrol along with the co-operation of the adjoining landowners they hope to keep out fires this year.

Fire protection is resulting in the establishment of a complete stand of pines in

many of the open areas in lands of this organization and in almost all areas a partial reproduction.

Twig Borers Active

Pine twig borers are attacking small areas of pine reproduction on lands of W. C. Potter and are causing considerable damage to the last year's growth of the plant.

These borers are confining their activities mainly to the loblolly reproduction ranging in height from about three to eight feet tunneling through the last year's growing portion to the limbs and causing them to die off. In many cases this will result in death of the little tree and in others will result in poor form development.

Pine twig borers present a difficult problem to handle as the larvae winter in the dead portion of the twigs and are present to begin their work again the next season. An effort will be made to confine their activities to these small areas and prevent their further spread.

Pulp and paper, lumber, mining, railroad and water power companies planted 21,638 acres to trees in 1931, the greater percentage being by water power companies.

LONGLEAF PINE FIRE DAMAGE

It pays to prevent fires in forests and woods. Foresters measured tree growth for 13 years on two plots of longleaf pine in North Carolina, one plot being burned over each year and the other being kept free from fire. The trees on the fire-protected plot grew 19 per cent faster in height, 9 per cent quicker in diameter, and 22 per cent faster in volume.

"Wood Eternal" Display

Cypress water pipes in New Orleans 139 years old and cypress shingles that covered George Washington's Mount Vernon home for 152 years will be among the exhibits of the Southern Cypress Manufacturers Association at Chicago 1933 World's Fair.

Light Pine Seed Crop

Philip C. Wakeley, chairman of the Intersection Committee of the Society of American Foresters, has issued the annual estimate of the cone crop of all species of Southern pine. Members of the Appalachian, Gulf States, Ozark, Southeastern and Washington sections, together with a number of non-member cooperators contributed information, there being 48 reporters, who submitted 88 separate reports. The species were longleaf, slash, loblolly and shortleaf. In most localities the crop is very light. The total number of bushels available cannot be ascertained, but the reports total 3,465 of longleaf, 3,420 of shortleaf, 1,355 of slash, and 1,760 bushels of loblolly.

BLUE STAIN AVOIDED BY FRESH GREEN WOOD

Handicap to White Pulp Easily Overcome in Paper Research Laboratory—Demonstration Cutting of Pulp Wood.

The most striking development in our work here during the past month has been the demonstration that it is perfectly feasible to use green wood for both chemical and mechanical pulp. It is interesting to note that the pulps so obtained are much lighter in color than those from seasoned wood; but of far greater importance is the fact that this enables us to overcome the difficulty of sap stain ("blue stain") which has troubled us so much throughout the summer. The hot, humid weather of late spring and mid-summer which is so favorable for rapid tree growth is also favorable for fungus development after the trees are cut. This trouble is now completely eliminated by the use of green wood.

After a long series of adjustments the paper machine is now working excellently and the pines pass in steady review when the pulp is fed on to the machine.

Arrangements have just been made with Mr. Elliott Reed of Savannah, Ga., to set aside a tract of young timber, about eighteen acres, on which there is a beautiful reproduction of loblolly, slash and longleaf pine. The site is an old field which was under cultivation in 1920. The District Forester, Jack Thurmond, is going to cooperate in the working of this tract so that it may furnish a demonstration of how pulpwood should be removed from a tract by thinning and leave the tract all the better off for growing trees for turpentine and lumber. Mr. Reed has generously offered to deliver the pulpwood to us at the plant without charge. The tract is located only six miles from Savannah, near the paved "Louisville Road" and can therefore be readily visited for inspection.

A valued addition to our staff in the last few weeks is in the person of Mr. Frank McCall of Savannah, a graduate of Virginia Military Institute where he specialized in chemistry. Frank is a volunteer for a year and has already found his place along with the rest of the staff.

CHAS. H. HERTY.

Correction

In the opening paragraph of the article in the September issue of Forestry-Geological Review quoting at length from Marion Renfroe's letter about his experiments in planting corn and pine together you did an unintentional injustice.

The idea of his financing the cost of planting the seedlings was entirely Marion's, not mine. I simply encouraged him to go ahead.

CHAS. H. HERTY.

BLUE STAIN OF WOOD AND ITS PREVENTION

Fungus Causes Much Damage to Logs and Lumber Hindrance to Making White Wood Pulp.

Wood is stained various colors by chemical reactions and by fungi. The most important to the timber owner who desires to sell his logs, bolts and pulpwood in best condition are the fungi, and among the fungi those causing blue stain are of chief concern. This enemy of the wood drives its threads or mycelia deep into the wood and feeds on the content of the cells.

The blue stain establishes itself quickly in freshly cut logs and continues in lumber cut from these logs. It usually appears first on the ends of logs, spreading rapidly throughout the sapwood. The heartwood is usually not attacked. The cells in the medullary rays are more susceptible than other cells.

It takes only four or five days for the fungus to begin staining the sapwood. Mature spores in 12 to 18 days, the spores being carried to new points of attack.

The amount of moisture in the wood appears to be a determining factor. Heartwood is usually not moist enough to favor the fungi. Under conditions of a living tree the moisture in the sapwood is too great for the fungi unless the tree is weakened by insects. If cut wood is kept immersed in water, the fungi cannot thrive. The danger as a rule comes from too rapid drying.

Tests with pine sapwood showed signs of blue stain in wood containing 10 per cent moisture (oven-dry weight basis). At 65 per cent wood was heavily stained and at 90 per cent the fungus ceased activity.

Blue stain is not an early stage of decay and is not objectionable where the stain is to be covered, stained or painted. In all practical purposes, blue-stained wood is as strong as unstained wood and has the same bending strength, but has slightly less toughness and surface hardness. It is claimed that blue stain retards penetration of creosote is said to be without foundation. Tests have shown that blue-stained portions of southern yellow pine have absorbed more preservatives than the unstained portions.

Wood Pulp and Stains

To convert blue-stained wood into white pulp requires more intensive bleaching, thus adding to the expense. Therefore, blue-stained wood is to be avoided. A record of a test is reported where pulp of bleached chips required 10.6 per cent bleach powder, whereas, unstained chips required 3 per cent.

Dr. Chas. H. Herty, Research Chemist in charge of the paper research plant at Savannah, advocates the use of freshly

ber before the fungus has had time to color the wood. Kraft paper mills, making brown paper and boards are of course not so much concerned with the color problem and do not find blue stain objectionable.

Living Trees Infected

According to Rumbold in *Journal of Agricultural Research*, Vol. 3, No. 10, at least two blue-staining fungi are introduced into pine trees by beetles. The two common bark beetles attacking living trees, the *Dendroctonus* and *Ips*, were found to carry blue-stain fungi into their burrows where the fungi proceed to develop in the adjoining sapwood. The *Dendroctonus* attacks vigorous trees and sometimes kills them. The *Ips* are more likely to attack sickly and injured trees. In view of the fact that these beetles infect the trees they attack with fungi, it follows that trees badly infested with beetles will be found, when cut, to have already been stained.

Ambrosia beetles are another set of insects that carry fungi into wood, in fact it is claimed that fungi are propagated by these beetles for their own food. The fungi discolor the wood around the beetles' burrows, making black holes. In time the blue stain spreads through the sapwood. This beetle attacks dying or newly felled trees.

Preventive Measures

The most economic and practical method of avoiding blue stain is to rush the log to the mills or pulp plants. An effective way is to store logs or bolts in water so that they will be completely immersed. If logs are not shipped immediately, it is well to treat ends of logs and scarred parts with hardened glass oil, made of rosin, lime and spirits of turpentine, with mixtures of barytes, asbestos and cryslic acid, costing about 60 cents per gallon, which will treat about 100 average logs. This will reduce checking of log ends as well as prevent stain. Barking and piling cordwood for wood pulp on skids, in sunny, airy, dry places, away from weeds, will permit rapid drying and thus reduce blue stain damage. If stored under shelter, it would be better. When harvesting pulpwood for making white paper, it is better not to cut trees infested with beetles.

Mexico Turpentine Controversy

The federal forest service of Mexico has issued an order that turpentine operators in that country must use the French method of turpentinizing. Producers in the Oaxaca district are protesting the order, claiming that the American method is as satisfactory as the French. The time for it for the change has not been set.

Lumber and timber products in Georgia are second only to the cotton goods industry in wages paid and the value of products.

FOREST FIRE FIGHTERS' NEW STATE ORGANIZATION

Small Land Owners to Cooperate in Fighting Each Others' Fires—Supplements Existing Timber Protective Organization.

The Forestry Division of the Department of Forestry and Geological Development has inaugurated an organization to be known as "Forest Fire Fighters" to supplement the present Timber Protective Organizations. The new organization is to provide for the needs of the smaller land owners who desire to cooperate in fighting each others fires. The existing Timber Protective Organizations are operated on a minimum of ten thousand acres per unit and fit in with the needs of large land owners.

The newest plan provides for areas where it is difficult to form 10-thousand-acre units. The organization provides leadership to carry out fire fighting plans and establishes local responsibility for forest fire control. Some fire fighting equipment will be recommended and instruction will be given by district foresters in methods of forest fire fighting.

The first unit of this type of organization has been formed among land owners in the region of Commerce. Reports coming to the state forester indicate that a number of communities are ready to sign up and put the plan into effect this season.

C. L. Veatch, professor of vocational agriculture at the Commerce High School, has been a leader in developing an organization of this type, in fact, initiated the first unit. The Commerce organization fitted in so well with plans which the state forester had been developing that the Veatch plan was adopted in large part.

In signing up as a member of a local Forest Fire Fighters unit, the land owner pledges to make a sincere effort to permanently keep fires off of his timberland; that he will employ methods of fire protection recommended by the State Forest Service; that he will aid other members of the organization, when called upon to fight fires on their lands, or fires that threaten to invade members' lands. Each member is to report fires on his land and the expense of controlling them.

The State Forest Service agrees to demonstrate methods of fire prevention and control, supervise fire fighting whenever possible, advise as to forest management, and to reimburse 50 per cent of expenditures made by the local organization from pooled funds used in purchasing fire fighting equipment.

The new organization is regarded as holding great opportunities for extending local cooperative effort in forest fire prevention and forest fire fighting. Hitherto, fires breaking out in most neighborhoods

in Georgia found no one ready to organize a fire fighting crew, with the consequence that the fires were allowed to spread to some firebreak, such as a road or stream, where they were stopped. With the new organization, as with a timber protective organization, it will be possible to get to fires in their incipency, put them out, and thus save a great deal of the damage done by unfought fires.

Crop Land Area

Crops occupy nearly half of the tillable acreage of the United States. This includes land in harvested crops and idle or fallow crop land. Most of the arable land not used for crops is of lower natural productivity, according to the United States Department of Agriculture, and the expense of draining or clearing it would probably not be justified at present.

Georgia First in Naval Stores

The turpentine and rosin industry, which is concentrated in the Southeastern states, reports half of its number of wage-earners, half of its wages paid and half of its production in the state of Georgia. More persons are employed in this industry in Georgia than in any other except in cotton goods manufacture, nearly 20,000 being the number in 1929. They received \$7,500,000 in wages and produced 16,000,000 gallons of turpentine and 1,000,000 barrels of rosin.

Tung Oil Consumption Drops

Domestic consumption of tung oil in 1931 was 82,314,000 pounds as compared to 97,474,000 pounds in 1929.

Consumption by industries was as follows:

INDUSTRY	1929	1931
Paint and Varnish	88,886	12,800
Linoleum and encaustic	5,900	7,300
Printers Ink	437	900
Miscellaneous Industries	2,688	1,193
Total	97,474	82,314

According to the United States census, nearly 70 per cent of the lumber sold by sawmills of Georgia is through wholesalers and brokers, this being the largest percentage to be thus marketed of any important lumber state.

Ocean Floor Survey

Robert Johnson, geologist, proposes to map the floor of the Pacific ocean from Panama Canal to China and is to report his findings to the University of Chicago. It may require 18 months to two years to make the survey.

Among the American hardwoods black locust is the strongest in proportion to its weight, and willow is the weakest.

The hardest American softwood is long-leaf pine; the hardest hardwood is orange.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

IRON ORES

Extensive iron ore deposits are found in the northwestern part of Georgia. They appear in two forms, brown ores and red ores. The brown ores are most abundant in Polk, Bartow and Floyd counties, but are found in nearly every county in north-west Georgia. The red, or fossil iron ores are confined to Dade, Walker, Chattooga and Catoosa counties and appear in the Red Mountain series well developed at Birmingham, Alabama.

History. So far as is known the first iron furnace put in blast in Georgia was that erected on Stamp Creek in Bartow county in 1840. In 1853 five blast furnaces were in operation in this county on Stamp Creek and Etowah river, each producing two to four tons a day. Charcoal was used as fuel.

Iron manufacturing in this region grew. The Cooper Iron Works on Etowah river became an important operation. Then Sherman's army came during the civil war and laid the furnaces in waste. Not until

The production of iron ore, however, continued. Ore was shipped to furnace centers in other states. From statistics of iron ore production in Georgia, the greatest output was in 1918 when 262,003 tons were mined. The production has varied with the demand and during the period of depression, the mining of iron ore in Georgia has largely ceased.

Geological Occurrences. Brown iron ores occur chiefly in pockets of irregular size. In some instances a deposit may contain only a few carloads, while in others, as near as Cedartown, deposits have been mined for over twenty years without being exhausted.

The depth the brown ore extends is also variable. In some cases they are found only a few feet thick, while in others they are found more than 50 feet thick.

Ore deposits are found in boulders or gravel associated with clays.

The fossil iron ores of Dade, Walker, Catoosa and Chattooga counties occur in various stratified outcroppings, with an



View of Underground working of fossil iron ore at Estelle, Walker county.

1870 was an effort made to revive production in Bartow county, but operation soon ceased and at the same time the Cherokee Furnace at Cedartown, of 50 tons' daily capacity, and Etna Furnace in Etna Valley, of 25 tons' daily capacity, went into blast. Both furnaces were in Polk county and operated on brown ores. Later on furnaces were operated in Floyd county, one at Rome, the other at Hermitage.

With the consolidation of iron furnace companies of the south, production to restricted areas, mainly in Alabama, came about and furnaces in northwest Georgia closed down.

average of two or more feet in thickness, extending in the aggregate of 175 miles, and capable of being mined economically several hundred feet deep. The main mass of this ore consists of iron oxide often in flaxseed-like particles or casts of fossils.

In addition to the ores mentioned, magnetic iron ores occur in various crystalline areas, among which may be mentioned near Union Point in Greene county, near Dahlenega in Lumpkin county, near Draketown in Haralson county, near Marietta in Cobb county. These and others may become economic sources of this form of iron ore.

The future development of iron ore deposits to the extent the great supply justifies, it is thought will occur only where furnaces are re-established in the vicinity of the deposits. In the same region of Georgia's iron ore deposits are coal deposits that produce a very high class of coke that may be used in the furnaces. Fire brick are made in this region. Lime stone, and in fact, all materials suitable for producing iron ore and steel are available in Georgia's iron ore belt.

Until furnaces are built in Georgia, the further production of iron ore deposits of the state will depend on transportation facilities and freight costs for reaching consuming centers.

FOSSILS OF MASTODON AN ANCIENT WHAL

J. E. Abernathy, a Bartow county farmer, unearthed part of a tooth of a mastodon and brought it to State Geologist S. W. McCallie for identification. It was found to be only part of a tooth of the enormous animal that once roamed the country many centuries ago. The tooth is a molar. The enamel is well preserved while the dentine, or interior of the tooth has in part crumbled away. The full width of the tooth is not revealed, but its length is about four inches.

Another interesting fossil recently unearthed in quarrying limestone deposits at Perry, has been identified by Dr. Leon Smith, geologist of Wesleyan College, Macon, as the petrified remains of a whale family living in the ocean in remote times when that part of Georgia was under sea level.

Order Tree Seedlings

Those who intend to obtain pine seedlings from the state tree nurseries should place their orders at once with the State Forest Service, 425 State Capitol. The supply is being rapidly taken up.

The annual meeting of the Society of American Foresters will be held at San Francisco, December 12 and 13.

The first saw mill operated in the United States was built at South Berwick, Maine in 1623.

There are more than 500 native tree species in the United States.

A new plastic material, called "Treplast" has been introduced in Norway by a manufacturer located in Frederiksted. This material is made from wood pulp and is said to be more durable than pyroxylin products.

Mahogany is the most difficult and expensive wood to log.

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STEPHENS HOME TO BECOME STATE PARK

Stephens Monumental Association Offers Liberty Hall, at Crawfordville, to Department Forestry and Geological Development for State to Maintain as Park.

Liberty Hall, Crawfordville, Georgia, has been offered to the Department of Forestry and Geological Development to administer as a state park, this department being the authorized agency for handling state parks. The home of Alexander Stephens and surrounding area of twelve acres is owned by the Alexander Stephens Monumental Association which offered to turn over the property to the state at the meeting of the Commission of Forestry and Geological Development held on October 7. The offer was accepted and control will be assumed by the department as soon as a deed of conveyance to the state has been executed.

The home of the noted statesman and vice-president of the Confederacy, has been preserved in the condition in which it was left by Mr. Stephens at the time of his death. The furnishings, library and mementoes constitute memorials of rich historic interest. A beautiful monument has been erected to Mr. Stephens on the property and above his grave on the property is a slab dedicated by the Old Guard of Georgia in 1913.

Plans are on foot to have eight acres and a large building owned by the United Daughters of the Confederacy adjoining the twelve acres mentioned, conveyed to the state and the whole made into one memorial park. The building on the property owned by the U. D. C. was erected for the purpose of establishing a Junior college in honor of Alexander Stephens, and is to be reserved for such use when the college is established.

It was through Mrs. Horace M. Holden, wife of Judge Horace M. Holden, Atlanta, that negotiations were instituted to transfer the Stephens memorial to the state. Mrs. M. E. Judd of the Commission of Forestry and Geological Development; T.

G. Woolford, president, Atlanta, and G. Ogden Persons, vice-president, Forsyth, of the Georgia Forestry Association; B. M. Lufburrow, state forester; and, later, Bonnell Stone, development agent of the Department of Forestry and Geological Development, visited the Stephens memorial and reported favorably on the proposition of making it a state park.

CHINESE CHESTNUTS THRIVE IN SOUTH GEORGIA

Blight Resistant Trees Five Years Old Bearing Nuts — Promising Tree Crop for Coastal Plains.

Five years ago 160 Chinese chestnut seedlings were planted experimentally at the Bamboo Experiment Station of the United States Department of Agriculture near Savannah. These seedlings are reported to have made remarkable growth, varying from 10 to 40 feet high, and are already bearing nuts. One bur displayed by D. A. Disset, scientist in charge of the station, had seven well developed nuts. These nuts are to be planted to see if this high rate of productivity can be carried over into the progeny.

The Chinese chestnut is highly resistant to the blight which has already destroyed most of the native chestnuts of this country. In cooperation with the United States Forest Service and the Georgia Experiment Station, the State Forest Service of Georgia has been introducing this variety of chestnuts in the mountains of north Georgia. Seedlings were grown at the mountain branch of the Georgia Experiment Station and planted in that region.

The planting near Savannah, in a region that has not grown the native chestnut, has developed unexpected and very promising results. The further progress of the Chinese chestnut under coastal plain conditions will be watched with great interest. Thus far, it is reported, the Chinese chestnuts at the Bamboo Experiment Station have been free of insects and disease.

UTILIZING THE DEAD CHESTNUTS OF GEORGIA

Blighted Trees Suited to Number of Uses for Several Years After Killed — Salvaging This Forest Asset Is Important.

About thirty years ago a fungous disease of Asiatic origin was found on chestnut trees in Bronx Park, New York City. Since that time this destructive disease has spread throughout the range of the chestnut in this country and has already killed most of the trees of this species.

About five years ago its appearance was first noted in Georgia. All of the state's chestnut area is now infected, with only a few scattered trees in the Piedmont area thus far escaping.

Chestnut trees in commercial quantities are found in the northern or mountainous part of the state, in probably all of the following counties: Rabun, Habersham, Stephens, White, Union, Towns, Lumpkin, Fannin, Gilmer, Dawson, Forsyth, Cherokee, Pickens, Murray, Whitfield, Catoosa, Dade, Walker, Chattooga, and Gordon.

The most attractive present demand for chestnut wood is from the tannic acid-paper mills in North Carolina and Tennessee. The chestnut wood carries a comparatively high percentage of tannic acid. The fibre, after the acid is removed, is well suited to making paper board, so that with this dual purpose, the chestnut offers advantages in these channels possibly greater than any other.

Thus far the tannic acid-paper mills have not provided a market for more than a small area of Georgia's chestnut belt. Whether they will do so in time to salvage the dead chestnuts of Georgia is doubtful. Therefore, it is well to also look to other markets.

Chestnut lumber is still in wide demand where light, durable wood is desired, such as caskets, cases, rough lumber over which veneer is placed, and for short dimension stock for a wide range of uses. The sawmill should, therefore, still be regarded as an important avenue for marketing dead chestnuts.

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Chestnut trees to be sold to the saw-mills should be cut as soon as possible, for after the bark drops from the dead trees, the wood begins to check or split severely, and too, the longer the dead trees are left in the woods, the more the insects bore into them.

Chestnut is well suited for mine props because of their resistance to rot. Coal, copper, zinc, iron and other mining companies operating in the south could use a considerable quantity of chestnut and would doubtless prefer it to other available species of trees.

Chestnut has always been a favorite species for telephone, telegraph, and electric wire poles. Resistance to decay, and lightness recommend chestnut for this purpose. A great amount of chestnuts of pole size is to be found in the coves and on the mountain slopes of north Georgia. While many poles have been cut in this region, they have usually been from the more accessible areas. Pole prices have not justified the expense of harvesting and hauling chestnut poles from the more remote mountain sections. Pole buyers have not undertaken to organize the development of the chestnut pole supply in north Georgia except in a few instances. More pole buyers is probably the chief need. Local initiative in this particular may be well worth while.

No organized effort has been made in Georgia to convert dead chestnuts into fence posts. No timber is more desirable for posts, for very few woods will last as long in contact with the soil. Areas of this country, particularly of the prairie

sections, afford an outlet for good posts such as the chestnut will produce.

Shingles from sound chestnut timber are very desirable. Chestnut also makes excellent crossties.

From the foregoing discussion, it may be seen that there are opportunities for salvaging chestnut trees. The best available market may not be the same in every community. It behooves the timber owners to investigate their marketing possibilities and to proceed to develop the most promising as soon as a revival of business opens up the various channels through which chestnut wood can be sold.

THINNING TURPENTINE TREES

Some data on the cost of thinning average pine forests to 200 trees per acre for turpentine purposes are given by James G. Osborne, forester, on the Ocala National Forest in Florida. The diameter breast high of trees removed varied from 1 inch to 5 3/4 inches and the number of trees cut per acre varied from 222 to 883. One stand of pines was 25 years old and the other 35 years old. The 35-year-old trees were harder and required more time to cut for any given diameter than the younger trees. The 1926 trees cut averaged 2.40 inches diameter breast high. The average cutting time was 6 seconds per tree. Other than chopping time, time per tree spent in going from tree to tree, etc., amounted to 8.64 seconds per tree.

The labor cost per acre in thinning 25-year-old trees with wages \$1.00 per day of eight hours, was 10 cents per acre when 200 trees were removed, 17 cents for 400 trees, 28 cents for 600 trees, 43 cents for 800 trees and 68 cents for 1,000 trees.

Thinning increases the rate of growth of the trees left on the ground and the more rapidly the tree grows the more gum it produces. The time for thinning, of course, is in the fall and winter. At that time the turpentine workers are idle.

CROSS TIES CONSUMED —TREE SPECIES USED

In 1931 the number of cross ties purchased was 46,096,935 compared with 85,662,513 in 1929; according to the U. S. Department of Commerce. Steam railroads took 43,737,809 of which 9,242,595 were treated. Electric railroads used 2,359,126 of which 753,529 were treated. The remainder were switch and bridge ties.

The number by tree species for steam railroads and electric railroads is as follows: Oak 16,909,321, Pines 10,837,121, Douglas fir 3,368,980, gums 878,354, cypress 3,204,655, hemlocks 1,002,565, cedars 1,390,906, maples 572,913, chestnut 141,387, beech 219,173, larches 399,341, birch 687,156, redwood 261,319; not specified and other species 6,233,664.

Vocational Forestry Club Reports

Camp Students' Future Plans

The thirty-nine students of the Vocational Forestry Camp who received certificates of vocational forester after completing six weeks' training in forestry in camp, were sent a questionnaire by the Educational Manager of the Department of Forestry and Geological Development. The questions asked sought information as to the future plans of these boys, most of whom have completed high school courses.

Asked if they intended to go to college, 34 replied in the affirmative, 4 no and 1 doubtful; but several of those who expressed a purpose to attend college indicated that they saw no way to finance the cost of a college course. In fact, in answer to the question "Is your family able to finance you through college," all except 4 said "no," two others saying "partly."

Undaunted, a number of the boys have sought loans and means of working their way through college. How many have succeeded in their efforts, is not now known. An effort will be made to check up on this and report later.

As one would expect, most of the boys intend to specialize in forestry in their college course. Out of those intending to go to college 20 will elect forestry if they go to college, 3 will specialize in agriculture, 2 in agricultural vocational teaching, 3 in agriculture or forestry, and 6 uncertain.

All who can not attend college would like to have non-technical forestry jobs and those who specialize in forestry in college intend to devote themselves to technical forestry.

Six students expressed their intention of entering the lumber or wood-working business, five expect to engage in naval stores production, two expect to engage in one or the other of these lines.

Eighteen students indicated their intention to do farming if they could not go to college, six of these expressing their intention to devote themselves to agriculture after attending college. All who remain on the farm intend to practice forestry on their farms and render community forestry service so far as possible.

From Martha Big Talk

District Forester C. N. Elliott, Augusta, received recently a letter from a student of Pierre Indian School at Pierre, South Dakota. The letter is as follows:

I am in the fifth grade in the Pierre Indian School. We are studying about forests. We would like for you to send us some material about your forests.

Thank you.

Your friend,
MARTHA BIG TALK.

VOCATIONAL STUDENTS VISIT PAPER PLANT

Twenty-five Students of Forestry, Georgia Industrial College, Barnesville, Go to Savannah to Inspect Paper Research Plant—Dr. Herty Explains Paper Making.

Twenty-five students of Georgia Industrial College headed by F. B. White, vocational agricultural teacher, went by school truck to Savannah, October 1, to study the production of paper at the state research plant. They carried tents and camped two nights, and also used the opportunity to study south Georgia trees and bamboos grown at the Bamboo Experiment Station near Savannah.

The Chamber of Commerce of Savannah and individual citizens saw to it that the boys had a full program of entertainment, including sightseeing and free admission to a football game. The G. I. C. boys were immensely pleased not only with all they learned but with the pleasure they

got from the excursion.

Dr. Charles H. Herty, chemist in charge of the research plant, was present, took the boys through the plant and explained each step in the production of paper from the wood to the finished product. He showed them that pines, gums and other woods of Georgia are capable of making excellent white newsprint and book paper. The proof of it was presented in samples of high-grade paper.

Dr. Herty told the students something of the history of the development of the idea of making white newsprint and book paper from southern pines, how misconceptions of the adaptability of the pine have been dispelled, and how the research paper plant is working out answers to technical problems of how to produce paper economically from pines. He led the young agriculturalists to expect a new market for their pines and various hardwoods.

The visitors were greatly impressed with Dr. Herty's words, and went away feeling that they had been honored by an opportunity to meet Dr. Herty and to witness an epochal step in the development of Georgia's great forest resources.

sites for school forests and will join the state's vocational teachers in making the white schools 100 per cent active in the vocational forestry work.

The new vocational agricultural schools thus far listed this year and their teachers are as follows:

Clarksville High, Clarksville, H. A. Inglis; Johnson Corners High, Lyons, J. H. Sims; Ocilla High, Ocilla; Mystic High, Ocilla, K. N. Phillips; New Branch High, Lyons, J. C. Richardson; Preston High, Preston, T. E. Ritchie; Cohutta High, Cohutta, C. R. Wilcox; Mt. View High, Marietta, L. T. Hagood; Alpharetta High, Alpharetta, P. L. Elkins; Seventh District A. and M. School, Powder Springs, G. L. Blackwell.

District foresters are making surveys of school forests and management plans to be carried out by the schools.

TAYLOR COUNTY FORESTRY MINDED

County Agent W. A. Lundy of Taylor county is in the market for 100,000 seedlings to plant in the spring. A number of land owners in that county contemplate putting idle lands to growing trees.

Taylor county not only has a county agent pushing forestry but an agricultural vocational teacher at the Butler High School who is teaching forestry, establishing students' home forest demonstrations and otherwise promoting tree production. As mentioned elsewhere J. S. Green, a prominent citizen, is offering \$25 in prizes for the best student essays on forestry.

POLE DEMAND, 1931 —TREE SPECIES USED

Five species of trees provided the 2,418,366 poles used in 1931. The number of poles used shows a decline of 47 per cent as compared to 1929.

Pines lead with 1,123,071 poles. Others are western red cedar 743,765, northern white cedar 301,951, southern white cedar 17,054, southern red cedar 11,025, chestnut 187,056, cypress 15,315, Douglas fir 7,057; all others 12,072.

Of the total of 2,418,368 poles used in 1931, 2,036,400 were treated and 381,966 were untreated. Most of the pine poles were taken from southern forests and 1,076,962 were treated or about 96 per cent.

Forestry Essay Prizes

J. S. Green, naval stores operator and progressive citizen of Butler, has offered \$25 in prizes to public school students of the county for the best essays on forestry. W. A. Lundy, county agent, is planning the contest.



Group of Students Studying Forestry at Georgia Industrial College, Barnesville, Starting on Interesting Trip to Savannah to Visit Research Paper Plant.

PAMPHLET DESCRIBES VOCATIONAL FORESTRY CAMP

A pamphlet entitled "The Vocational Forestry Camp" prepared by Paul W. Chapman, Director of the Division of Vocational Education of the State, and issued by that division, has appeared.

The introductory statement of the publication is: "Georgia has developed a unique and practical method of teaching forestry to farm boys. Perhaps the most interesting feature of the plan is the Vocational Forestry Camp. This school-camp, which is held annually for a period of three weeks during July and August, is an intensive training course in practical forestry designed for those boys who have demonstrated through their knowledge and accomplishments that they have a special interest in forestry."

The pamphlet describes the school-camp plans of practical courses, field work, excursions, athletics, entertainments, awards, and closes with a statement taken from

the winning essay of John Noland of Walker Park, as follows: "What a wonderful thing to bring together in one group the boys from every county in the state who are most interested in forestry! It will mean much in the building of citizenship and in creating the desire in all of us to be of greater service to our fellowmen."

NEW SCHOOLS PLAN FORESTRY PROJECTS

Rural Consolidated High Schools of Georgia Join 100 Per Cent in Co-operative Work With State Forest Service.

While some rural consolidated schools have discontinued their vocational agricultural departments and automatically ended their work in forestry, others have inaugurated vocational agricultural teaching. All of the vocational agricultural teachers in the new schools have selected

FORESTRY QUESTION BOX

Has southern pine been used for making rayon?

Only in an experimental way. The Hercules Powder Company has made excellent artificial silk from fiber of pine stumps from which naval stores products had been extracted. An exhibit of rayon from this source was made by this company at Rome during the annual meeting of the Georgia Forestry Association in June of this year.

Red spruce is the wood most generally used in producing rayon. Since it has been demonstrated that pine fiber is adapted to rayon production, perhaps it will be looked to as a future supply of cellulose material for this purpose.

Which are the better seed, those from a young or from an old pine tree?

Planting records show that seed from young, thrifty trees give a higher percentage of germination than seed from old trees. The seed from young trees usually weigh more also.

What should I do to control an outbreak of bark beetles in pines?

Cut out the infested trees, remove the wood, burn the limbs and debris left by the tree. Since beetles usually attack weaker trees, it may be well to stimulate growth next spring by fertilizing trees around the spot where the infested trees were removed. Barnyard manure or sulphate of ammonia, or a complete fertilizer may be used.

How should I prune a large oak tree?

Cut off the limbs that are encroaching on the roof of your house by removing them close to the trunk. Also cut off dead limbs and thin out other limbs that you think can be spared. Do not cut off all limbs and the top, leaving a stub. If the tree is not killed outright by this severe treatment, it will not last long because decay will usually set in in the stub and the new limbs will have such poor connection with the trunk that they are likely to be stripped off by a storm.

Paint the wounds made in removing limbs. A creosote paint is preferable.

Which will produce more heat, pine or hickory?

According to the Forest Products Laboratory of the United States Department of Agriculture, pound for pound, pine wood gives off more heat than hickory. A cord of hickory, being heavier than pine may give off more heat than a cord of pine. Most resinous woods, like pine, have a higher heat production value per pound than non-resinous woods.

How much oil will a tung oil tree produce and what would it be worth?

Tests made by the University of Florida over a period of ten years on full bearing

trees, showed an average yield of 24.08 pounds per tree. The average yield of oil has been 33 1/3 per cent. The average price of oil has been around 15 cents a pound. Each tree, therefore, produced approximately \$1.20 worth of oil per year. An acre of 63 trees, at this rate, would yield \$72 in oil each year. The grower, however, would ordinarily sell nuts to an oil mill and could not get the full oil value. But the oil mill market will doubtless offer a price that would make growing tung oil nuts profitable.

How high up would it be advisable to prune young pines?

Not more than half the height of the pine. Greater pruning will slow up the growth. Pruning is now recognized as a profitable practice in improving the quality of logs, also in improving conditions for turpentine faces.

Pines and Perfumes

The Pines are of interest and importance in that they are the source of numerous aromatic oils which find their way into the perfume industry either in the original condition or as the basis of synthetic chemicals which have odor values.

While turpentine as such is not of any use in perfumery, the alcohol "Terpineol" and its esters, prepared from it are of the greatest importance. Terpineol is the basic odor of lilac, lily, narcissus and many other plant perfumes, and is one of the triumphs of the chemist in the industry for its fragrance and cheapness.

Various pine needle oils are employed as aromatic sprays for theatres and hospitals.

Cypress tree branches yield a fragrant oil which contains "Cypress camphor" as a constituent and used as a fixative in various scents.—Robert Glenk, in Conservation Review (La.).

Oak Moss

In the Louisiana Conservation Review Robert Glenk, Curator, Louisiana State Museum, in an article on perfume yielding plants, has this to say about oak moss:

"Oak Moss, a lichen of the *Parmelia* family, grows abundantly on the live and water oaks of the South. It has a characteristic odor which is extracted by petroleum ether and is in great demand for the composition of heavy bouquets and perfumes. The natural products range in price from five dollars to twenty-five dollars per pound.

"It may be interesting to know that this lichen formed part of the funeral equipment of the early kings and was an article of commerce in Egypt five thousand years ago. It was used as an ingredient in bread making and in the form of pulverized oak moss was used as a hair powder in colonial days, imparting both tint and odor to the coiffure of the ladies and the wigs of the gentlemen."

FIRST FOREST FIRE FIGHTERS ORGANIZED

Lee County, Under District Forester H. D. Story, Jr., Forms First of New Forest Protective Organization.

Lee county has the distinction of forming the first of the newly authorized Forest Fire Fighters organization. The organization signed up 5,465 acres, subscribed \$100 for fire fighting equipment and members agreed to help each other construct fire breaks and to fight fires.

Officers of the organization are P. A. Price, president; H. G. Tison, vice president; J. T. Hooks, secretary-treasurer. Other initial members are J. E. Workman and George Larsen. District Forester Story reports that he has prospects of adding several new members to this organization.

This new type of organization is to supplement the Timber Protective Organization already in existence, particularly to meet the needs of land owners who find it difficult to organize 10,000-acre units, the minimum called for by the Timber Protective Organization plan.

The Division of Forestry hopes that the new plan will prove popular especially in parts of the state where land holdings are in comparatively small bodies.

Naval Stores Returns, September —Show Increases

According to computations of the Carson Naval Stores Company, Savannah, which appear in the Naval Stores Review, the naval stores producer enjoyed an appreciation per unit at the still in the value of his output in September over August of \$34.63 as compared to \$29.04 for August, a gain of 18 per cent. September was the first month this season showing a net return to the still greater than for a corresponding month of the previous season.

Naval Stores Demonstration

On October 4 and 6, were demonstration days at the naval stores experiment station at Olustee, Florida. A number of visitors including some Georgians witnessed methods recommended by the United States Bureau of Chemistry and Soils, which yielded over three gallons more turpentine per charge than ordinary methods.

Naval stores operators are invited to the station to bring their production problems to its attention. The office of the stations is located at Lake City, Florida.

FIRST DISTRICT

W. D. Young, District Forester
Rome

Milton County Forest Survey

Statistics of the old Milton county survey show that the present timber stand of the area amounts to 80,066,380 board feet for all species, and 11,668 cords of pulpwood in addition.

The area surveyed, excluding the Roswell district, the town limits of Alpharetta and of Mountain Park, amounted to 83,394 acres, of which 46,550 acres are in cultivation, 36,517 acres in forest, including merchantable timber and restocking areas, and 327 acres of grazing land.

Three timber types were considered in making the survey: pine and hardwood type; pine type; hardwood type.

The pine-hardwood type, which has a greater acreage than either of the other two, has a total acreage of 12,982 with board foot content of 35,921,194. The amount of pine in this type is 53 per cent and that of hardwoods 47 per cent.

The pine type has an area of 9,546 acres with a total board foot content of 32,370,486; 82 per cent pine and 18 per cent hardwood.

The hardwood type has an area of 4,806 acres with a total board foot content of 11,774,700. Eighty-seven and one-half per cent of the volume in this type is in hardwoods and 12½ per cent is in pine.

The area restocking embraces 9,183 acres out of the total forested area of 36,517 acres, approximately 70 per cent. Practically all areas restocking are coming back to pine, most of which is loblolly.

The report and map of the area will soon be finished, after which a more detailed article on the findings in the county can be published.

Lookout Mountain T. P. O. Has Good Record

A visit was made by the District Forester to the Lookout Mountain T. P. O. during the last few days of October.

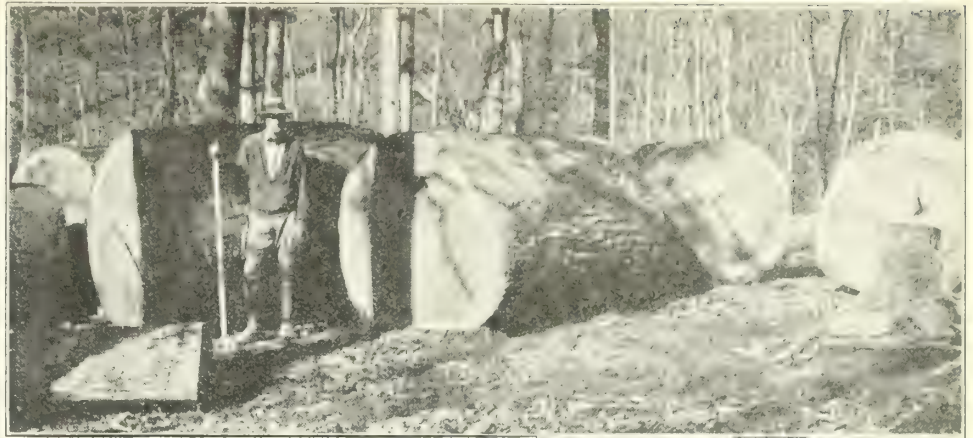
The patrolman, O. C. Green, stated that the T. P. O. had a very successful protection program last fire season.

During the fire season from October 1st, 1931, through May 30th, 1932, only four fires were reported on the Lookout Mountain T. P. O. of 12,500 acres. This speaks well for the efforts of the patrolman as well as the local landowners and tenants who cooperated with him in keeping fire out of the woods.

Mr. Green says that he believes that he will be equally successful this fire season.

Vocational Schools Visited

All vocational schools in District One will be visited by the middle of November. District Forester Young has been delayed in making visits to the schools on account of working on the map and report of Milton county, which is about completed.

**SECOND DISTRICT**

E. B. Stone, Jr., District Forester
Gainesville

Enormous Tree Removed From North Georgia Forest

Some idea of the value of the forests of North Georgia was very forcibly brought out through the cutting and sale recently of an enormous yellow poplar or tulip tree on land of the Pfister and Vogel Company in Towns county.

This tree is one of the largest and, as far as we know, the largest tree of which any authentic record has been kept. This tree grew near Jacks Gap north of the Blue Ridge in a deep, moist cove, the site on which this species of tree usually occurs.

The tree was 69 inches in diameter at a point 4½ feet from the ground, and the total board feet scale was 8,931 feet. On account of the fact that the tree was what is known as curly veneer material it brought a price of \$30.00 per thousand board feet, making a total value for the tree of \$267.93.

Yellow poplar or tulip tree, the technical name of which is *Liriodendron tulipifera*, is the only remaining species of the family widely distributed throughout North America; and the only other species of this family, which is a small tree, grows in Asia.

Owing to the fact that this most valuable species has a power to resist disease and occurs usually on moist sites where it is not so apt to be injured by forest fires it has managed to survive over many thousand years.

The yellow poplar reaches its best development in the mountains of north Georgia, and since the inauguration of fire protection throughout this region it is beginning to extend its range and is rapidly occupying old fields and other suitable sites so that it is continually adding to the wealth of the forests of this region.

The photographs give some idea of the enormous size of this tree. The production of timber of this size and quality is one of the direct results of fire protection.



Monster North Georgia Mountain Yellow Poplar. Below, the Standing Tree; above, Cut into Logs. (Courtesy U. S. Forest Service.)

T. P. O.'s Get Ready for Fire Season

The fall fire season will soon be here and preparations are being made to prevent and control forest fires.

The local timber protective organizations have thoroughly repaired their telephone lines. Trails and roads have been repaired so as to make the forest more accessible to fire fighters, and tools and equipment have been overhauled and placed at points where they may be secured in case of need.

Several protective units are in process of being formed and an effort will be made to extend the State's cooperation to more land owners this year than ever before.

All those who use the woods are requested to use every caution in preventing the escape of fire, as many fires are caused by the carelessness of hunters and other people who travel through the forests.

Gorgeous Fall Forests

With the coming of frost and the fall season the forests are rapidly taking on a wonderful variety of coloring as the foliage gradually turns from green to various shades of yellow, orange, red and brown.

By the beginning of November this coloring will probably be at its best and this is one of the most inviting times to visit the more heavily wooded sections of the state. The coloring of the foliage is especially fine in the mountain regions, and those who would enjoy the thrill of the out-of-doors at this time will find the Vogel State Park on top of the Blue Ridge on the Appalachian Scenic Highway the most inviting area in which to enjoy an outing. On account of the excellent views which can be secured from points within this area it is particularly interesting at this time of the year to get the color effects of fall foliage.

The forest of the Indian Springs State Park is also most inviting, and a walk through the winding trails in this area, which is a mass of color at this time of the year, is one long to be remembered.

The location of these two state parks is shown on the state highway map. They are readily accessible by automobile. These areas are the property of the state and are maintained for the use of the people, and it is hoped many will take advantage of the opportunity which these areas provide for wholesome recreation.

THIRD DISTRICT C. N. Elliott, District Forester Augusta

Insurance on Pine Trees

At least one man believes in the insurance of his pine forest against fires. Judge Henry C. Hammond of Augusta, who owns a beautiful home in the hill country north of Augusta, has insured the pine forests and the shrubs within three hundred yards of his home to the amount of \$3,000,000. The terms of the insurance are that every tree destroyed or partially destroyed is worth at least \$10.00. In August of this year fire originated in a house on the adjoining property, burning through the woods into Judge Hammond's insured pine forest. His helpers saw the fire and beat it out but some of the trees and shrubs had been burned. The Judge notified the insurance company and they sent men down to take stock of the damage. They refunded him \$383.00 for the damage done by the forest fire.

Cheap Saw Mill in Elbert County

Not long ago when Mr. Whittle and the district forester visited Centreville, in Elbert county, they had a chance to observe one of the cheapest saw mills ever put in operation. Three conservative brothers decided to clear up a piece of bottom land

and make fire wood out of the cords of logs cut from the area to be cleared. Consequently they bought a saw mill for approximately \$12.00. The circular saw was the most expensive part about it, costing \$6.00. An old Ford automobile rigged up to run the saw, cost exactly \$5.00. Miscellaneous nuts, bolts, and screws, etc., amounted to approximately \$1.00, making the saw mill cost somewhere in the neighborhood of \$12.00. When the saw bit into an especially large or tough piece of timber a man at the carburetor opened the throttle to speed up the engine, giving the saw a burst of speed.

Plans Work on Forest Area

Miss Elizabeth Holt, who owns approximately 950 acres of forest land in Burke county, plans to carry out a program of forestry to cover a number of years. She has already advised the tenants on her place to watch for any fires occurring on her property and the adjoining property and promptly suppress them. She plans to plow a number of firebreaks both along the road and through the property where they are needed. Her program calls for the planting of approximately ten acres of long leaf pine, a couple of acres of walnut, and the thinning of at least a part of the 950 acres. Miss Holt is to be complimented on her decision to practice forestry on her land.

Doctor Herty to Speak in Augusta

Doctor Charles Herty, research chemist for the Department of Forestry and Geological Development, will make an address at Augusta on Wednesday, November 2nd. Members of the Garden Club and several large landowners as well as prominent people in and around Augusta will be invited to attend the meeting.

FOURTH DISTRICT W. G. Wallace, District Forester Columbus

Meriwether County Forestry Fire Prevention Organization Plans Meeting of Statewide Interest—Franklin D. Roosevelt Expected to Attend—Dr. Charles H. Herty to Speak.

Dr. Chas. H. Herty will make the principal address at a meeting of statewide importance to be held in Warm Springs, Georgia, Tuesday afternoon, November 22nd. His subject will deal with problems that have a profound bearing on the future economic welfare of Georgia and the south.

Governor Franklin D. Roosevelt, of New York, one of the staunchest supporters of the forestry movement in America is expected to attend. Governor Roosevelt is a member of the Meriwether Forestry Fire Prevention Organization of which Capt. A. S. Persons is president. This or-

ganization is one of the regular Timber Protective Organizations cooperating with the state and federal government in forest fire prevention and control.

In a special statement to the Forestry-Geological Review last June Governor Roosevelt made known his views concerning the "whole economic future of Georgia." This statement was with reference to the proper use of land. It will be the purpose of this meeting to discuss the proper solution of the idle land problem in Georgia. Forestry leaders from throughout the state are expected to attend.

Franklin D. Roosevelt Highway Marked

On October 1st a meeting was held in Warm Springs for the purpose of planning and locating the "Franklin D. Roosevelt Highway". Mrs. J. R. Terrell of Greenville presided and was elected chairman of the organization.

The Franklin D. Roosevelt Highway has been marked from Atlanta by way of Warm Springs and Waverly Hall to Columbus with attractive temporary markers. The various counties through which the highway runs will take the initiative in establishing permanent granite markers. Women's garden clubs in most of the communities along the highway have volunteered to beautify the markers with shrubbery and flowers.

The district forester attended the organization meeting and volunteered the services of the Division of Forestry in improving the forests and preventing and controlling forest fires along the highway. This service was graciously accepted as it is well known that Governor Roosevelt heartily indorses the conservation of our forests and other natural resources.

Mrs. J. R. Terrell, Greenville, Taking Course in Forestry

Mrs. Terrell, wife of Judge Render Terrell, is so enthusiastic about the progress of forestry in Georgia that she is taking a correspondence course in forestry from the University of Georgia in order that she may better serve her state in that respect.

In every community throughout the state there is a separate and distinct need of the influence that can be exerted towards better forestry by the women who take an active interest in the general welfare of their community. Meriwether county is fortunate in having such a leader in Mrs. Terrell. May forestry in Georgia have an ever increasing number of women supporters like her.

FIFTH DISTRICT H. M. Sebring, District Forester Macon

Thinning Demonstration

Mr. R. J. Paul of Eastman has agreed to the use of 10 acres of his land for a thinning demonstration. The land is part

of his pasture and is situated 2½ miles from Eastman on the Rhine road. It was cultivated eleven years ago and since then a good stand of slash pine has gotten started. The trees are too close together in many places and if some are thinned out the remaining trees will develop more rapidly.

W. D. Hillis, county agent at Eastman, and H. M. Sebring, District Forester at Macon, are going to thin the tract this winter and use it as a demonstration plot, since it is located on one of the main county roads. The owner has agreed to protect the land from fire and prune the trees left standing.

SIXTH DISTRICT Jack Thurmond, District Forester Savannah

Oconee T. P. O. Growing

The acreage and membership of the Oconee Timber Protective Organization has practically doubled since it was formed two years ago. In 1930 the area under protection was 10,000 acres with seven members. On October 5th a meeting of the T. P. O. was held in Uvalda and nine new members admitted, making the total acreage 17,000. All members of this T. P. O. plan to begin work on their firebreaks on or about November 1st in order to have them completed by January 1st when the fire season comes in. Solid plowed firebreaks have been used by practically all the members of this T. P. O. and they have been very effective as well as easy to construct and maintain. Breaks of this type can be plowed with mules and made from 10 to 15 feet wide at a cost of \$3 to \$5 per mile and maintained after the first year for as little as \$1.50 per mile by freshening them with a heavy harrow.

Chatham County T. P. O. Formed

On October 13th a meeting was held in Savannah and a Timber Protective Organization was formed with an initial acreage of 17,000 acres and nine members. State Forester B. M. Lufburrow and Dr. Chas. H. Herty, research chemist, attended the meeting and made short talks before the business of actually organizing and election of officers was started.

The land listed in the T. P. O. is concentrated in northwestern Chatham county, near Bloomingdale and Pooler, and includes some of the best timber growing land in southeast Georgia.

Mr. D. C. Newton of Bloomingdale was elected president of the T. P. O. Mr. J. Carter of Bloomingdale was elected vice president and Mr. Elliott Reed of Savannah, secretary-treasurer.

All indications point to an immediate increase in acreage. The area under protection should come to about 35,000 acres. Firebreak construction work will begin on November 1st.

SEVENTH DISTRICT C. Bernard Beale, District Forester Waycross

Model Fire Truck for Hazzard's Neck

A completely equipped fire truck has been assembled by the Georgia Forest Products Company and will be used on their Hazzard's Neck tract in Camden county.

The truck was designed by Karl Meschke, forest supervisor. Its equipment includes a hand lever pump, a 250 gallon tank for water, a reel containing 75 feet of hose, 20 feet intake hose sections with intake strainer, six 5-gal. back pumps, six fire swatters, hoes, axes, shovel, a western fire "swamping" tool, keg for drinking water, one back-firing torch, a field telephone set, and a first aid kit. The truck can comfortably carry a crew of eight and many more in an emergency. It has the disc-type wheels, with extra-size low pressure tires, and on a recent trial was able to successfully pull through every mud hole.

A stream 30 to 40 ft. is thrown by the pump operated by two men. The truck is painted a bright yellow and an electric siren gives the alarm all over the forest area, concentrating all forest employees at the scene of the fire.

"Revenuers" Reported Burn Woods

During a trip through the wild, sandy, scrub oak ridge country of the Satilla river drainage area in southern Coffee county recently, the district forester stopped a native for information. He was a strapping young fellow—a disciple of Paul Bunyan—who, with his plodding steer, was headed for the river swamp to "snake out" veneer logs.

When asked if the land burned over every year, the native replied "Sometimes every year, then maybe not in three or four years." Volunteering further information, he declared that the past spring a party of "revenuers" had located a whiskey still in the midst of the brush and that in destroying the still, they had ignited it and walked off, leaving "fiahr" to get out and burn over all the country around. It was his opinion that the "revenuers" had caused more land to be burned over than the people living thereabouts.

Recreational Development, Winona Park

Under the supervision of L. V. Bean, Waycross city manager, and through co-operation of the State Highway Department, and the county road crew, Winona Park, one-time trolley car amusement resort near Waycross, is being again improved, through the sponsorship of the local Kiwanis club.

The area occupies about thirty acres and has an open natural basin in the center of

several acres, flanked by gradual, wooded slopes on each side. The basin formerly held water, but due to failure to maintain the dam in recent years, has been dry. The basin has been cleared of stumps, regraded, and the dam is now being rebuilt at the upper end.

There are quite a few old boxed, veteran longleaf trees on the area. A large number, due to annual fires, had become infested with the *Dendroctonus* beetle and died during the past year. Under the direction of the district forester, all diseased and undesirable trees were marked and subsequently cut into cordwood. The thinning yielded 175 cords of wood and around 60 negroes were given work over a period of two weeks, during this operation. A further release thinning is planned during the winter.

The purpose of this development is to provide an outdoor recreational spot for the use of civic organizations. Jim Harley, president of the Kiwanis club, has been pushing the project for several years, and it is largely due to his efforts that the present work has been begun.

VOCATIONAL STUDENTS' FORESTRY CONTEST AT FAIR

First Trial in Tree Identification at State Fair at Macon Proved Popular Feature of Judging Contest—Large Number Participated.

Vocational agricultural students from 59 high schools of the state participated in their annual judging contests at the state fair at Macon, but whereas the contests have hitherto included seeds, plants and livestock, this year tree identification was introduced at the suggestion of M. D. Mobley, district supervisor of vocational agriculture at Tifton. More than 170 boys from all parts of the state took part. As this was the first time tree identification was introduced, only 15 tree species were used. Writing about this innovation, Mr. Mobley says:

"The Tree Identification contest was an outstanding success in the opinion of all the teachers of vocational agriculture. We will probably enlarge this phase of our contest another year by adding more species of trees to be identified."

H. M. Sebring, district forester at Macon, assisted in the contest and Development Agent Bonnell Stone and Educational Manager C. A. Whittle were present and very much pleased with the outcome. The boys made excellent records in identifying the leaves that were displayed.

Fred B. Merrill, State Forester of Mississippi, was a recent visitor in Atlanta.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

LIMESTONES OF GEORGIA

Limestone is probably used in more ways than any other stone. It is adapted to building, cement, paving, curbing, flagging, mortar, concrete, railroad ballast, roadbeds, furnace flux, for soil improvement, etc. Limestones are of sedimentary origin, the most common commercial form being calcium carbonate. Lime (calcium) is, however, associated with a number of minerals and is a prominent part of marble, dolomite, marl, etc.

Occurrences—Limestone is found in the coastal plain as argillaceous and marl beds; in the Piedmont plateau in stratified beds, usually recrystallized into marbles, and in the Appalachian valley of northwest Georgia in stratified form, principally as calcium carbonate or dolomite.

Lime never occurs in nature except in combination with other substances, such as carbon, sulphate, silicate, phosphate,

Physical characteristics of calcareous materials vary from loose shell marl of the coastal plain to the hard crystalline marbles of the mountain section of the state.

Magnesium limestone occurs in Stephens, Habersham, Hall and Gwinnett counties in the eastern Piedmont section of the state. Calcareous materials in the mountains suitable for lime and cement are the Murphy marbles which are found in Fannin, Gilmer, Pickens and Cherokee counties.

Limestones of the Appalachian valley and Cumberland plateau part of the state are found in Polk, Floyd, Chattooga, Dade, Walker, Catoosa, Whitfield, Murray, Bartow and Gordon counties.

Limestones and marl in the coastal plain are found in Burke, Screven, Washington, Johnson, Wilkinson, Bleckley, Twiggs, Bibb, Houston, Pulaski, Dooly, Macon, Sumter, Schley, Webster, Stewart, Ran-



Limestone Mining Operation near Perry this Deposit is Producing a Large Amount of Crushed Stone for Road Construction in Georgia.

etc., and on account of the ease with which it enters into combinations it is found in many common rocks.

Limestones are classified largely according to their chemical composition. A limestone very high in calcium carbonate with a small percentage of impurities is known as high calcium carbonate. Limestones containing more than 5 per cent of magnesium carbonate are known as magnesium limestones, and when magnesium carbonate attains 30 per cent or more it is called dolomite. When alumina and silica range from 15 to 20 per cent, the rock is classed as argillaceous limestone.

Marble and other calcareous minerals have high percentages of limestone and in many ways serve the same purpose.

dolph, Clay, Calhoun, Dougherty, Lee, Crisp, Worth, Mitchell, Baker, Early, Decatur, Grady, Thomas, Brooks, Lowndes, Echols, Charlton, Camden and Glynn counties.

Development—The history of the lime industry in Georgia extends back to early settlements. Burned lime was used for mortar and for soil improvement from the earliest days. Georgia limestone has been used for road construction, cement manufacture, railroad ballast, curbing, concrete construction, fluxing for furnaces, mortar, etc., in increasing amounts as time passed. The available supply of lime materials has, however, been barely touched. The greatest development of lime deposits has occurred in northwest Georgia.

The first use of Georgia limestone and shale in the manufacture of cement began in 1903 at Rockmart in Polk county when H. F. Vandeventer organized the Southern Portland Cement Company. A second cement plant, the Piedmont Portland Cement Company, also in Polk county, was established in 1911.

The greatest development of lime for agricultural uses and burned lime for building purposes, has occurred in northwest Georgia. Lime for applying to the soil has grown in importance as the benefits to crops have become better known and as the growing of legumes that respond very profitably to lime occupy increased acreage in the South.

The deposits most extensively used in northwest Georgia are the Chickamauga limestone, dolomite and Bangor limestones.

Among other uses to which lime can be put are the manufacture of sand-lime bricks, calcium carbide, calcium nitrate for water softening, glass manufacture, in the ceramics industry, paper manufacture, wood distillation, sugar manufacture and tanning.

GOLD MINE OPERATIONS IN DAHLONEGA DISTRICT

According to a press report from Dahlonega, Georgia, renewed activity is occurring in developing the gold deposits of that region. Dahlonega was a center of gold mining previous to the gold rush to the West nearly a hundred years ago, and once boasted a United States mint.

The Crown Mountain property has been acquired by A. T. Leavitt, Ontario, and extensive operations are reported in prospect.

The Topabri Company is operating in the old Auraria district and is reported working a promising body of hard ore. In the same district, the Betz property is being opened up in quest of a vein that had previously yielded good results.

On Cane creek placer mining is progressing on the Barlow property where in recent years nuggets weighing as much as 80 and 24 pennyweight have been found. Renewed operations are also reported in Dawson and White counties where considerable gold has been obtained in the past, mainly through placer operations.

Wood Sugar Commercialized

The Deutsche Bergin A. G., which for the last three years has worked on the experimental saccharification of wood, is reported to have purchased a factory at Mannheim-Rheinau where the Bergius process will be placed on a commercial basis.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 2

ATLANTA, GA., DECEMBER, 1932

No. 12

HUNTERS, BEWARE!

Watch Your Tobacco Sparks, Put Out Your Warming Fires, Protect the Forest and Foster Game.

The hunting season is now in full swing. Game is reported plentiful and doubtless more than the usual number of hunters will be invading fields and forests. No one would deprive hunters of their sport, and, some of them, of necessary food. Good luck to the hunters!

But be careful not to start fires that will burn forests and reduce the supply of game. Trees can not run or fly from the fire. They must stand and suffer. Game may escape the winter fires, but what is good hunting grounds today will be charred and black lands when the fire sweeps through, and game will have moved away, possibly into swampy areas where there is protection both from fire and hunters.

Hunters start fires mainly by accident. A warming fire built on a cold day is left burning. A wind blows sparks or embers onto nearby grass and leaves, and a forest fire has started.

Hunters are usually smokers. A cigar or cigarette stump still burning is dropped onto the grass or leaves; the hunter passes on and in his wake a raging forest fire flares up. Or the hunter may knock burning tobacco from the bowl of his pipe with a rap on the heel of his shoe. Enough fire is released to start a flame that may spread over thousands of acres of woodland, fire that will kill young pines and stunt the growth of larger ones.

Some hunters, usually boys of a neighborhood, after rabbits, start a fire to drive their game out of briar patches, and then go away to let the fire rage at will. Often possum hunters having treed their game in a hollow butt of a tree build a fire to smoke him out, then having achieved their purpose, move on to let the fire spread into the woods.

Forest fires do great damage to the forest and to game as well, which, if hunters fully appreciated, would make them very careful not to be responsible for starting.

FORESTRY MEETING HELD AT BRUNSWICK

Executive Committee of Georgia Forestry Association Greeted by Forest Enthusiasts of Southeast Georgia.

An enthusiastic forestry meeting was held at Brunswick, Georgia, October 27, complimentary to the Executive Committee of the Georgia Forestry Association which was attended by a large number of timber owners of southeast Georgia. Col. R. E. Benedict of Brunswick was largely instrumental in arranging the meeting which was held in connection with a dinner at the Oglethorpe hotel.

C. B. Harman, Atlanta, chairman of the Executive Committee, presided. A. S. Kloss of the Hercules Powder Company, Brunswick, spoke of the cellulose prospects of southern woods, among them paper making. He predicted that as the textile mills moved from the north to the south, so would the paper mills. He felt sure the outcome of the research work of the paper plant at Savannah would determine there is ample material for pulp mills in the south.

Col. R. E. Benedict spoke on growing timber and told of possibilities where proper attention is given. He cited results obtained from an acre planted near Brunswick which in 28 years grew 49 cords of wood suitable for pulp wood, or 1,770 board feet of lumber, or 220 cross ties and 35 cords of pulp wood, or 200 turpentine faces worth \$50 per acre for a 12-year lease. Other similar citations were made showing how well timber growing in the southeast will pay.

Alex Sessoms of Cogdell, large timber owner, told of shipping 10 cords of pine to a paper mill in Maine for experimental purposes and a second shipment which, he concluded, indicated that the paper company was developing interest in southern pines.

Speaking on "What the Forestry Association Means to Georgia," C. B. Harman, chairman of the Executive Committee and long-time active member of the association, said that the association had inaugurated the state's department of forestry and fos-

(Continued on Page 2, Col. 1)

ADULT NIGHT CLASSES IN FORESTRY AT SCHOOLS

District Foresters to Assist Vocational Agricultural Teachers in Conducting Work in Forestry for Adult Classes.

Arrangements have been completed for starting night classes in forestry for adults at a number of vocational agricultural schools in the state. The work in forestry will be conducted by the vocational teachers in a manner similar to that used by them in adult classes in agriculture. District foresters are scheduled to assist the teachers on this project.

This undertaking has met the hearty approval of the heads of vocational teaching as well as by those directing forestry activities.

The adults are to be taught reforestation, fire protection, thinning, wood utilization, and, in South Georgia, turpentine methods.

The methods used are informal conferences in which adults give the results of their experiences and ask questions with the district forester, as an expert, giving such information as is desired.

It is expected that through the vocational agricultural schools a large number of leading farmers may be reached and that better forestry practices will result. Twenty to thirty communities will be reached this year and after the year's trial it is expected that the work will be extended to all vocational agricultural schools.

Dr. Cary in South

Dr. Austin Cary, of the United States Forest Service, who has spent considerable time in recent years studying southern pines, is again in this section making headquarters at Lake City, Florida, where he will be glad to be of service to naval stores operators and others.

It is reported that Dr. Cary is planning to write a summary covering all the investigations he has made in various studies of southern pines. This will doubtless be an important contribution to forestry literature relating to the south.

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(Continued from Page 1)

tered its interests from the beginning, and it had guarded the department from being involved in politics. He said the association had not yet succeeded in getting the legislature to enact tax laws more favorable for growing forests than at present. He called attention to the great services of Mr. T. G. Woolford, president of the association, and Bonnell Stone, secretary, both of whom were unavoidably kept away from the meeting. Mr. Harman urged the timber owners to make hay while the sun shines, that trees are going to be worth more in the future.

CUT CEDAR CHRISTMAS TREES WISELY

Many thousands of cedar trees are cut annually in Georgia for Christmas. The cedars can be made a source of farm income at this time when the landowner's income is very small.

But the trees should be cut with good judgment if the cedar lands are to bring the greatest profit. Let the harvesting be a thinning. Frequently the cedars are too thick to make the best growth. When some are removed the remainder grow more rapidly and will more quickly attain fence post or pencil stock size at which time they can be sold at good profit.

No species of tree makes a more shapely and suitable Christmas tree than cedar, and to many people in the south, the aroma of cedar is associated with Christmas cheer.

NAVAL STORES MEN VISIT PAPER PLANT

Impressed That Harvesting Pulp Wood Need Not Interfere With Naval Stores Production.

Following a meeting of naval stores operators in Savannah, those attending accepted an invitation to visit the paper research plant in that city. Dr. Charles H. Herty and others conducting the research work at the plant explained the operations and told of the success attained that indicated very certainly that southern pines would find use in the manufacture of white paper.

The naval stores men asked how this new use of slash and longleaf pine on which they depend for their raw material would affect the naval stores industry. The explanation was made that the paper industry would provide a market for thinnings of prospective turpentine forests and would thus bring forests to earlier and heavier gum production. It was also pointed out that after trees are turpented and are made available for saw logs, poles, etc., that the tops or parts of the tree ordinarily left on the ground to decay, could be marketed as pulp wood.

H. L. Kayton, Savannah, a leader in the naval stores industry, expressed his opinion on the subject as follows:

"In my judgment, the advantage of having the paper industry located in this territory is the fact that it would create a market for small stuff such as could be gathered in thinning operations. If such a market could be established, I believe it would result in better fire prevention methods being adopted by landowners, that eventually the burning of trees would dwindle to a matter of small proportions, lands would be protected and young timber encouraged to grow on tracts which today are practically denuded of timber."

Those who visited the plant were as follows: H. H. Bruen, J. A. Myers, A. T. Hussey, and C. L. Murphy, of the Columbia Naval Stores Company; C. H. Carson, Carson Naval Stores Company; A. F. K. Mustin, E. M. Smith and P. A. Mackall of the Antwerp Naval Stores Company; George W. Drummond of the Consolidated Naval Stores Company; A. D. Pace, Turpentine & Rosin Factors, Inc.; J. R. Sweat, J. M. Blaine and C. M. Jordan, of the Operators Factorage Company; R. E. Thorpe and W. J. Farmer, R. E. Thorpe & Company; A. G. Cassels and R. Frank Cassels, of the Cassels Company; J. L. McLeod and O. T. McIntosh of the Southern States Naval Stores Company; J. C. Schwarz, Jr., of the Pine Products Export Company; E. F. Walsh of the John R. Walsh Company; J. E. Lockwood of the J. E. Lockwood Company; Sigo Myers, capitalist; J. F. Jackson, agricultural agent and J. M. Mallory, industrial

agent of the Central of Georgia Railway Company; J. N. McBride, agricultural and industrial agent of the Seaboard Air Line Railway Company; W. J. Morgan and J. C. Morgan of Morgans, Inc., and Thomas Purse, secretary of the Savannah Chamber of Commerce.

FORESTRY ASSOCIATION EXECUTIVES MEET

Following a forestry meeting of timber owners of southeast Georgia held at Brunswick, a meeting of members of the Executive Committee of the Georgia Forestry Association was held at which matters relating to the development of association work were discussed. A satisfactory meeting is reported.

Following the meeting of the committee, those attending went to Savannah where the research paper plant was inspected and a luncheon was attended where a number of Savannah business men were present. The association is to hold its next annual meeting in Savannah during the period set aside for celebrating the founding of the State of Georgia.

Those attending the meeting of the executive committee of the association were President T. Guy Woolford, C. B. Harman, Mrs. M. E. Judd, R. E. Benedict, Alex K. Sessoms, and J. Phil Campbell.

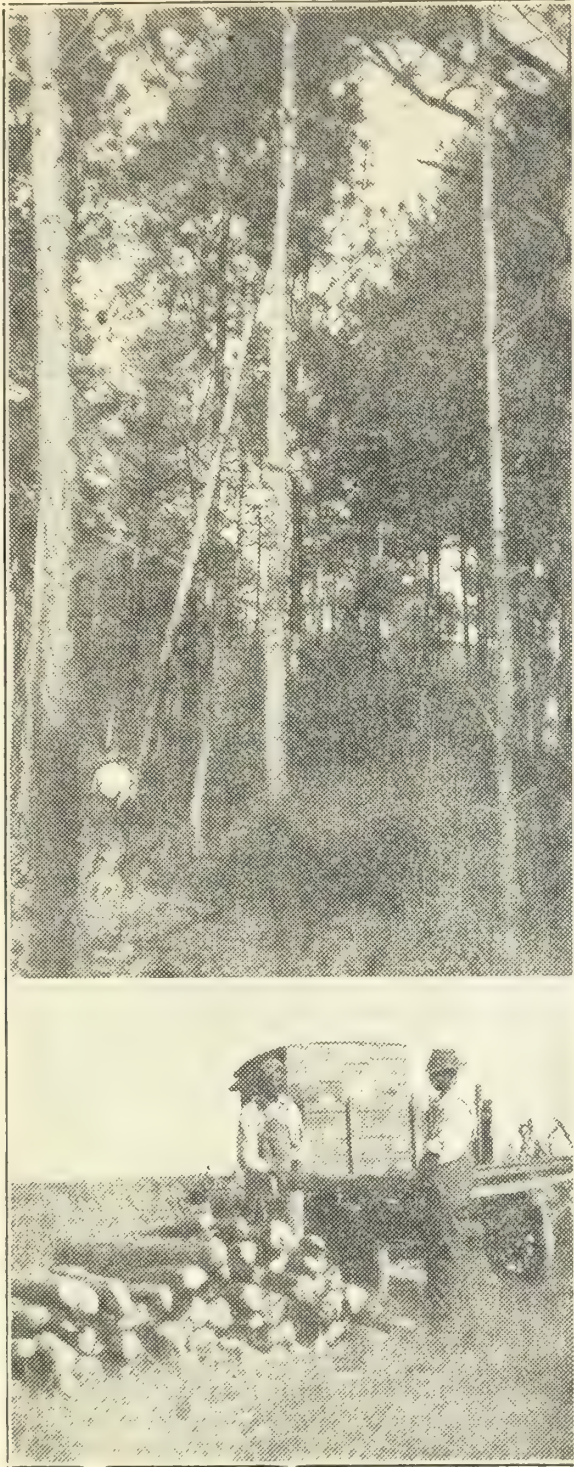
FIRST NEGRO FIRE FIGHTERS' ORGANIZATION FORMED

Eleven Negroes at Omaha Join in Co-operative Fire Fighting—Professor H. E. Hall, Vocational School Teacher, Helps.

The first negro forest fire fighters' organization formed in Georgia has been reported by District Forester H. D. Story, Jr., of Albany, who credits H. E. Hall, vocational agriculture teacher at the Omaha Training school, Omaha, Georgia, with arousing interest and for calling the meeting resulting in the organization. This organization is located in Stewart county.

Eleven negro property owners whose land adjoin each other have signed up 603 acres in this unit and have pledged to help each other to fight fires and to take preventive measures recommended by the district forester. Incidentally, it may be stated that this is the second of the fire fighter organizations to be formed after the new plan had been launched by the State Forest Service.

The officers of the new negro organization are: M. C. Walton, president; A. D. Morris, vice-president; Rev. A. J. Holtzclaw, secretary and treasurer. Other members are M. L. Evans, Aaron Walton, Charlie Ford, Cornelius Ford, David Davis, Amy Frye, J. A. Pettis and Ben Wiley.



QUICK CHANGE—PINES TO PRINTED PAPER

Trees Cut at Augusta Made Into Paper at Savannah in 48 Hours—Printed and Distributed in 60 Hours.

A demonstration of how quickly and how well southern pines can be converted into white paper was conducted at Augusta on the occasion of an address of Dr. Charles H. Herty before the civic clubs of that city on November 21.

C. N. Elliott, district forester at Augusta, cut pines off the state forest at Augusta, rushed them to Savannah, where the research pulp and paper plant converted them into white paper in 48 hours from the time they were cut. The result-

ant beautiful white newsprint paper was rushed to Augusta, where the program, and the cuts reproduced herewith, were printed, and distributed in 60 hours from the stump.

This was a stunt that accompanied a very interesting address by Dr. Herty that told of great possibilities of making white paper from all kinds of Georgia pines. The address was enthusiastically received by citizens of Augusta.

ENGLAND-BEALE

Miss Clarice England, Blairsville, and Charles Bernard Beale, district forester at Waycross, were married November 1 at Neel Gap, with Rev. W. B. Mills, Blairsville, officiating.

The marriage ceremony took place on the crest of the Blue Ridge Mountains in Vogel Park at an altitude in excess of 3,000 feet, with colorful fall foliage making a gorgeous setting for the outdoor wedding. Though informal, it was a beautifully unique wedding in the woods, appropriate to the calling of the groom.

Only a few relatives and friends were present, very few knowing of the intended marriage. Mrs. A. L. England, mother of the bride, Mrs. Eula Caldwell and Mrs. Cary Earnest, sisters of the bride, Mr. Cary Earnest, all of Blairsville, Fred Beale of Savannah, brother of the groom, and Everett B. Stone, Jr., district forester, Gainesville, besides the minister, were attendants of the wedding.

Following the marriage ceremony a wedding supper was tendered at the Dixie Hunt Hotel, Gainesville, by Everett B. Stone, Jr., following which the bride and groom left on a honeymoon trip, destination unknown.

After November 10, Mr. and Mrs. Beale were at home at Waycross, Georgia. Both have many friends in the state who wish them great happiness.

The bride is a cultured, charming member of a prominent family in Union County, while Mr. Beale is a native of Savannah, a graduate of the University of Georgia and prominent in forestry work.

FIRE LOSSES NATIONAL FORESTS REDUCED, 1932

The burned area in national forests of the country was reduced in 1932 to 397,722 acres compared to 605,073 acres for 1931. More than half of the loss was in the Santa Barbara National Forest where 220,000 acres were burned over. Elsewhere the United States Forest Service had the best record for many years.

"Woodlot" a Misnomer

A recent questionnaire sent out by the United States Forest Service develops that the term "woodlot" is misunderstood by landowners and should be discarded. The words "woodlands" or "woods" are preferred.

FORESTRY QUESTION BOX

What is flexwood?

A description of this new material is given in the Journal of Forestry by Reginald T. Titus, which is reproduced here-with:

"Closely related to plywood is a new product called flexwood, used primarily as a wall covering. Flexwood consists of very thin wood veneer (usually of walnut, mahogany, or oak) backed with a stout fabric. The sheets of wood, measuring less than one-eightieth inch in thickness, have previously gone through a patented process intended to break the wood into innumerable fine columns, and this is said to prevent subsequent cracking or warping. The finished product is sufficiently thin and flexible to be applied in the same manner as wall paper, and gives the appearance of solid wood paneling at a fraction of the cost."

Is mistletoe an enemy of trees?

Mistletoe is a parasite on the living trees, that means, it saps from the tree materials that otherwise would go into tree growth. The grey hanging mosses of the south are not parasitic. They get their living from the air and use trees only as a convenient object on which to make an attachment.

At what rate does the yellow poplar grow?

The United States Forest Service has made a study of the rate of growth of second-growth yellow poplar in Sosbee Cove, Union county, Georgia, one of the best stands on one of the best sites in the country. Under natural conditions, without thinning or other treatment, the area measured showed that the yellow poplars were adding 756 board feet per acre annually.

On average sites of full stands, the growth would probably not average more than from one-half to two-thirds this much.

Does the Japanese beetle threaten to become a serious forest pest?

Entomologists claim that the Japanese beetle is not a menace to well-stocked forest areas. Their attacks will be more disastrous to fruit trees and shade trees because the adult beetles are sun lovers and their larvae require grassy areas for development. Favorable conditions for the beetle, therefore, do not exist in forests, or at least only on their edges.

How much faster is rainfall absorbed by a forest soil than by agricultural soils of the open field?

Dr. John T. Auten of the United States Forest Service reports investigations of unburned and undisturbed forest conditions that show soils one inch beneath the duff or organic matter deposited on the floor of the forest, absorbs water nearly fifty times as rapidly as agricultural soils

in open fields; at three inches, seventeen times faster; and at eight inches, two and a half times more rapidly. This, of course, explains in part why forests have less surface run-off of water and less erosion.

TUNG OIL TREES TESTED IN GEORGIA

In Press Bulletin 355, issued by the Georgia Experiment Station, H. P. Stuckey, Director of the Station, says: "Generally speaking, it would not be safe to plant inland much more than 100 miles from the coast."

The station began tests in 1908 with tung oil plants received from its southern range in China, and a small number have been grown at the station ever since. The results indicate that the variety of trees used should be grown only in the southern part of the coastal plain of the state in view of their susceptibility to cold.

Director Stuckey, however, states that tests are being conducted with hardier tung oil trees brought from north China. Only a few years' observations have been made, not long enough to draw definite conclusions, but he states that these new varieties are showing up somewhat favorably.

Dr. Wm. Folks Dies

Dr. William Folks, age 43, surgeon, died October 31 at Waycross, where he was born and where he won distinction as a physician and public-spirited citizen. He was intensely interested in forestry and was vice president of the Georgia Forestry Association. The cause of forestry has lost, in the death of Dr. Folks, one of its ablest champions.

SEEK REVISED STATISTICAL SERVICE ON NAVAL STORES

At a meeting of the Savannah Stores interests at the Savannah Board of Trade, a resolution was unanimously adopted asking that reports on production, distribution, consumption and stocks of naval stores be made by the United States Department of Agriculture in three separate classes, as gum naval stores, steam distilled wood naval stores products, and destructively distilled wood naval stores products.

It was requested that the U. S. Department of Agriculture disseminate all statistics on naval stores except those relating to foreign and domestic commerce, and that statistics of gum naval stores and wood naval stores should be fully compiled and separately reported at the same time.

The village of Ebern, Germany, has a town forest that pays so well that no taxes are collected for operating the town. Furthermore, the forest provides to each householder a load of wood and 60 marks annual dividend.

WHITE PINE GROWTH IN SOUTHERN MOUNTAINS

J. A. Cope, Department of Forestry, Cornell University, discussing white pine in the southern Appalachians in the November issue of the Journal of Forestry this year, says in his conclusions:

"The excellent growth rate of white pine in the southern Appalachians, as shown in both natural stands and in plantations, indicates that it should have an important place in the forests of these mountains.

"The control of white pine blister rust and white pine weevil, the two most serious enemies of white pine in the northern part of its range, do not present so difficult or expensive a task."

Discussing the rapid growth of white pines in the south, Mr. Cope says: "On an abandoned field in the French Broad district of the Pisgah National Forest, a 25-year-old stand of white pine showed frequent spacing of four feet between nodes and 2.5 and 3 feet were the rule rather than the exception. Similar rapid height growth was found in sections of the Cherokee National Forest, particularly on Cooper Creek in North Georgia."

Reference is made to the Biltmore Plantations, near Asheville, where the best site growth of 195 cubic per acre per year is reported for trees 26 years old from planting.

A plantation at Highlands, N. C., with 22 years' growing seasons, is reported as having an average diameter, breast high, of 8.1 inches; height 45 to 55 feet for dominant trees; an average of 6.1 inches diameter and heights 37 to 45 feet for intermediate trees; an average of 4.5 inches diameter and heights 30 to 35 feet for over-topped trees. The number of live trees per acre is 1,010, which measure 5,460 cubic feet of timber per acre.

Mr. Cope studied the presence of wild currants and gooseberries, the intermediate host plants for blister rust, and concludes that there is little to fear from a southern advance of blister rust.

The lack of large areas of open grown white pine in the south and the great activity of the downy woodpecker in feeding of the weevil are assigned by Mr. Cope a warranting his statement that this insect will not present a serious menace.

LOWER RAILROAD RATES FOR SOUTHERN PINE SOUGHT

The impending reductions in transcontinental rates on fir lumber of the west coast has resulted in a plea by southern pine producers to southern railroads to reduce rates so as to avoid a greater trade advantage which the lower rates will give western producers. No action has yet been taken.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

Patrolmen Employed

The two patrolmen employed by District Three for six weeks beginning November 15 and ending December 31, are E. L. Stephenson, of Covington, and J. W. Cooper, of Athens. Mr. Stephenson is at present in Burke county, where more than 70,000 acres have already been signed up in the Burke County T. P. O. So far, this land is scattered, lying in all sections of the county. However, it is gradually being blocked in.

Mr. Cooper is working at the present time in Hart county, where he is organizing the vocational schools and landowners into a Hart County Forest Fire Fighters' unit. Later on these men will work out in other counties of the district.

Bank Promotes Pine Planting

The Georgia Railroad Bank and Trust Company of Augusta is contemplating improving several farms they hold in trust by planting pine seedlings in the marginal land of the farms. The district forester made a trip not long ago with Mr. Lee S. Trimble, vice-president of the bank, and tentative plans were outlined for the improvement of these farms, subject to the approval of the bank's trust committee. Mr. Trimble explained that the seedlings were to be planted for the purposes of: (1) The prevention of erosion. (2) Improvement of the soil. (3) For the timber which in a few years will be valuable to the owner. This is a forward step in forestry in the state, and the Georgia Railroad Bank and Trust Company is to be congratulated on taking this step in the management of their land held in trust.

Forestry Exhibits

Two forestry exhibits of note at fairs District Three were those of the Richmond County Exchange Club Fair by J. K. Mahan, vocational teacher at Wrens, and the McDuffie County Fair at Thomson, County Agent James Purcell. These exhibits were very good and contained the valuable information for farmers and landowners.

D. F. Broadcasts

Ye District Forester is putting on a fifteen minute radio broadcast from Radio Station WRDW in Augusta, at 5:30, every Monday and Wednesday afternoon.

N. D. Burleigh, of the U. S. Biological Survey, from Asheville, will be a visitor in the Augusta district some time in December.

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Meriwether County Forestry Fire Prevention Organization Holds Annual Meeting, President-Elect Roosevelt a Member

At a recent meeting of the Meriwether County T. P. O. the following officers were re-elected: A. S. Persons, President; T. J. Long, Vice-President; S. M. Stout, Secretary - Treasurer; Directors E. B. Doyle, A. C. Newman, and Fred Botts. Sidney Williams was appointed as lookout to be stationed in the 75-foot Charles Lamar Davis Memorial steel lookout tower on Pine Mountain.

President-elect Roosevelt is a member of the Meriwether County Forestry Fire Prevention Organization and was instrumental in its organization. The fire prevention work on Pine Mountain, in which this T. P. O. has pioneered, has led to such a reduction of the number of fires and acreage burned on Pine Mountain that it is a matter of general conversation when forestry is the subject talked of in that section.

Pine Mountain is the southernmost foothills of the Appalachian Range. It is a range of mountains heading near Barnesville, Georgia, and running southwest into Alabama. The elevation of its ridges is from 200 to 400 feet in elevation above the surrounding country. Pine Mountain gets its name from the beautiful longleaf pine forests which formerly adorned it but are now practically all cut. It is still a Mecca for nature lovers because of its multitudinous varieties of flowers which blossom continuously from early spring to late autumn, and because of the pine and oak forests which are reclaiming the rugged slopes and ridges to the accompaniment of forest fire protection.

Taylor County Fair Shows Interesting Forestry Exhibits

Under the direction of Mr. W. J. Culbertson, Vocational Agriculture teacher, forestry exhibits were prepared which would convince any open-minded person of the damage caused by forest fires.

One exhibit showed two containers filled with soil; one containing soil taken from a forest burned over annually, and the other containing soil taken from a similar forest through which no fire had been allowed to burn. It was found that when equal amounts of water were sprinkled into each container the soil taken from the unburned area was able to conserve a much greater amount of the moisture due to its organic content. This pointed to the fact that greater tree growth could be expected as well as increased resin flow from thrifty turpentine trees when protected from fire.

Exhibit Number 2 compared the growth

of two longleaf pines taken from burned and unburned areas. It was found that a longleaf pine tree 16 years old and subjected to periodical fires was actually smaller than a longleaf pine six years old taken under similar growing conditions with the exception that no fire had been allowed in the forest from which it came. It was also shown that the needles on trees from burned areas were much shorter than the needles of trees from protected areas, thus resulting in lessened resin flow from turpentine faces.

It was estimated that practically the entire citizenry of the county attended this fair. Taylor county is particularly to be congratulated on having such outstanding men for county agent and vocational agriculture teacher as W. A. Lundy and W. J. Culbertson in addition to citizens taking an active interest in the welfare of the county.

FIFTH DISTRICT

H. M. Sebring, District Forester
Macon

Fire Patrolmen Employed

Three special forest fire patrolmen began work in the Macon District November 15. S. A. Clements of McRae, who worked as patrolman last spring, was again employed and assigned the district comprising Telfair, Wheeler and Laurens counties. Mr. Clements has had long experience in managing turpentine operations, and being a landowner who protects his own land from fire, together with his past experience as patrolman, is well equipped to render efficient service.

Russell Franklin of Eastman, was employed to patrol the counties of Dodge, Wilcox and Pulaski. Mr. Franklin is a graduate of the Forest School at the University of Georgia and has had experience in fire control and other phases of forestry since his graduation. Last spring he was employed as fire patrolman in the Waycross district, but was transferred to his home section.

C. C. Brannan of McRae, was employed and assigned to the district consisting of Crisp, Dooly and Houston counties. Mr. Brannan has had experience protecting and managing a turpentine forest, and is expected to render efficient service as a fire patrolman.

These patrolmen will concentrate on contacting landowners and the formation of cooperative fire fighting organizations. They will also take the initiative in suppressing fires in their respective territories. Each patrolman will be equipped with two fire pumps, two fire swatters, one rake and one axe.

Jones County Fire Fighting Organization Being Formed

A fire fighting organization in Jones county is in the process of formation. The

influential landowners are anxious to get the work started, and are working toward getting a consolidated area in the vicinity of Dames ferry on the Ocmulgee river. The area to be included in the organization covers approximately 5,000 acres of cut-over land lying along the Ocmulgee river. An organization meeting will be held within the near future.

SIXTH DISTRICT

**Jack Thurmond, District Forester
Savannah**

Chatham T. P. O. Plans to Buy Tractor and Hester Fire Break Plow

The Chatham County Timber Protective Organization, organized on October 13 with 17,000 acres, has increased its holdings to 23,000 and just as soon as the signed acreage totals 30,000 the T. P. O. will purchase a "Thirty" Caterpillar tractor and Hester five disc fire-break plow for use on the organized area.

The organization will also be able to plow for individuals not near enough to come into the organization, but who want to protect their land from fire. This work will cost the non-member landowner \$3.00 per mile. The secretary-treasurer, president and vice-president have already looked the outfit over and will purchase one as soon as the signed acreage is sufficient to warrant the purchase.

Four Temporary Patrolmen in District 6

On November 10 three temporary forest patrolmen were appointed to work territories in the Savannah district and one man started work on November 15. The men are stationed at Flemington in Liberty county, Claxton in Evans county, Brooklet in Bulloch county and Soperton in Treutlen county. These men will work until January 1, 1933. Their duties are to help fight any fires where the landowner needs assistance, give information as to how fire pumps and other fire fighting equipment should be used, to contact schools and especially all negro schools; also appear before civic clubs whenever possible. They will cooperate with organized T. P. O.'s and explain their work to individuals who do not happen to be members. They will also help in organizing Forest Fire Fighters' units, which enable landowners having scattered tracts of timber to receive aid in protecting it from fire. Any landowner is invited to get in touch with the nearest patrolman.

Fire Break Construction Started in Liberty County

The Liberty County T. P. O. has already started constructing its fire breaks for the coming fire season. Many of the breaks which were plowed last year will be maintained, but as several new members have been added about 100 miles of new breaks will be put in this year.

W. I. Stafford, who is secretary-treasurer and also patrolman for the T. P. O., is in charge of the work and is using plowed and burned breaks again this year as they are easier to make with the tractor which he is using, two furrows being plowed about 25 feet apart and the intervening strip burned out. Fire breaks of this type will be good this year as all the ponds and bays are full of water and are not a source of danger as they were last year. Fire breaks of this type at the present price of labor will cost \$3.50 per mile.

SEVENTH DISTRICT

**C. Bernard Beale, District Forester
Waycross**

Crisp School Organizes Longleaf Forestry Club

Through the efforts of Guy Waddell, principal and vocational teacher, a Longleaf Forestry Club has been organized at the Crisp Consolidated school near Stockton in Lanier county. The club has a membership of thirty-five, composed of boys and young men ranging in age from 14 to 35 years. Membership in the club is not limited to boys in school but includes many young men not in school.

Major objectives of the club are as follows:

1. Protection of timberland from fire.
2. Development of rural leadership and an appreciation of forest resources.
3. To train students in public speaking through debates and discussion of forestry questions.
4. To conduct a permanent forestry demonstration.

An athletic team is to be sponsored by the club. It is planned to construct a log cabin as a meeting place. Two meetings are held each month on the first and third Monday nights.

The idea of forming the club was conceived by a vocational boy who attended the vocational camp the past summer.

Forest Fire Patrolmen Placed

Portions of eleven counties in the Seventh District will be covered by four patrolmen who have been placed to cover areas as follows:

Patrol No. 1—Pierce, Bacon and northern Ware counties.

Patrol No. 2—Eastern Lanier, northwestern Clinch, western Atkinson and southern Coffee counties.

Patrol No. 3—Berrien, Cook and northern Lowndes counties.

Patrol No. 4—Western Echols, eastern Lowndes, western Lanier, and southwestern Clinch counties.

EIGHTH DISTRICT

**H. D. Story, Jr., District Forester
Albany**

Dr. Herty Heard

A joint meeting of Kiwanis, Rotary and Lions clubs and the Chamber of Commerce, was held at Albany, November 9, for the purpose of hearing Dr. Charles H. Herty on the progress of his research work in the use of southern woods for making white paper.

John A. Davis, president of the Chamber of Commerce, Albany, introduced Dr. Herty who spoke enthusiastically about the prospects of the south becoming the future center of making newsprint and book papers. He told of the progress of his work which showed thus far that all kinds of pines grown in Georgia are adapted to making paper of high quality. He stressed the importance of guaranteeing an adequate supply of pulp wood, and the largest return to the timber owner, by promoting forest fire control. He asked that every citizen lend his influence to creating public sentiment against burning the forests and in helping the State Forest Service in its great objective, the protection of Georgia's forests.

The address was received with enthusiasm and hopefulness that the time is not far distant when a new and important market for timber of the state will be created.

T. P. O. Enlarged

Hollis Lanier and the Citizens and Southern Bank have added 1,744 acres to the Pine Island Timber Protective Organization near Albany. Firebreaks will be constructed on the new acreage as planned by the district forester. Firebreak construction will also be extended on the property of Reynolds Brothers who have large holdings in this organization.

New School Forest

The Preston school, Webster county, has established a school forest of 28.2 acre near the town and will begin their work for the first year.

The work of this school and school forest will be under T. E. Ritchie, who has shown his interest in forestry and in his school by his efforts and good work in the past.

The school forest is a very beautiful piece of property, about 14 acres being loblolly pine from one to about twelve years of age and conditions of growth are such that demonstrations of thinning and other phases of forestry can be carried on in the different aged stands.

About 14 acres is open land to be planted out in either slash or loblolly pine and the management plan calls for planting in such a manner that all classes will get the benefit of this demonstration.

The school and community are indebted to Mr. Rees for his kindness in leasing the property of the school of Preston.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

CYANITE IN GEORGIA

A Museum Mineral Becomes Commercial

RICHARD W. SMITH

Assistant State Geologist

Most of us have been made familiar, through extensive advertising in the magazines, with the fact that a certain brand of spark plugs are made from sillimanite. But few know the romance of research and applied science that lies behind the recent dramatic uses of the sillimanite group of minerals. Sillimanite, cyanite, and andalusite all have the same chemical composition, aluminum silicate ($\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$), but are quite different in appearance, crystal structure, and physical properties. They have long been known to mineralogists and geologists, but were considered to be of no commercial value. Cyanite was of scientific interest as it is the only common mineral that is much softer in one crystal direction than in the others. In 1908 it was noted that most porcelains when examined under the microscope showed interlocking needle-like crystals that resembled the natural mineral sillimanite. Later these crystals were found to differ slightly from sillimanite and were given the name mullite."

About 1917 ceramists of the United States Bureau of Standards were given the problem of developing a better spark plug core. Cores that would better resist sudden changes in temperature and high heats were necessary for aeroplane motors for war use. They decided to experiment with sillimanite, but, because of the scarcity of the natural minerals of this group, they decided to prepare synthetic sillimanite by joining clay and artificial alumina. This synthetic sillimanite was deliberately incorporated into a porcelain body in a quantity larger than it would have been possible to develop from the clay contained in the body. It was used as a substitute for other ingredients, especially quartz or potter's flint. The addition of the sillimanite caused the body to replace potter's flint, and the firing of the body to a temperature high enough to develop mullite in the clay resulted in a body with a mechanical strength two to four times as great as normal porcelain. It also improved heat-shock resistance and made a much better spark plug core. Other studies showed sillimanite to be constant in volume and to possess characteristics that would be beneficial if it were used as an ingredient in high-heat duty refractories. Fire brick

made from sillimanite bonded with clay outlasted all other types. The high heat to which they were subjected seemed to increase the network of mullite crystals and therefore their strength.

The successful use of synthetic sillimanite caused manufacturers to search for the natural mineral in commercial quantities. Obviously a suitable natural mineral would be less expensive and more stable than the artificial substitute. The officials of one company manufacturing spark plugs searched through the mineralogical literature, following up every possible lead with systematic prospecting, and finally located a large deposit of andalusite high in the mountains of California near the Nevada line. This is the only deposit of andalusite in commercial quantities thus far located. Natural sillimanite is even more scarce. A few small outcroppings have so far been found in the United States, chiefly in South Dakota. Large but rather inaccessible deposits have been discovered in India. Sillimanite and andalusite have the advantage in that there is no appreciable volume change when they are converted to mullite on heating to about cone 12 to 13 (1310° to 1350° C., 2390° to 2465° F.). This makes it possible to use them without previous calcination, and has the tendency to form a better bond of inter-locking mullite crystals in the finished product.

Cyanite occurs usually in long-bladed or platy crystals and crystal aggregates. The color varies from white and light-gray to blue, grayish-blue, and greenish-blue. The crystals are often blue in the center and white along the edges. The cleavage is perfect in one direction, less perfect at right angles to it, and with a parting in the third direction. The most characteristic feature, aside from its appearance, is its hardness, which is $4\frac{1}{2}$ parallel to the length of the crystals and 7 perpendicular to the length. This means that a knife-blade will easily scratch cyanite parallel to the long way of the crystal but not across the crystal. Its specific gravity is 3.6, considerably heavier than quartz (2.6). When calcined to about cone 12 to 13 (2390° to 2465° F.), it expands considerably, principally in the long direction of the crystals, and the original specific gravity (3.6) drops to that of a mixture of mullite and glass (3.1). The calcined material is friable and more difficult to bond than raw andalusite. For these reasons cyanite is not as satisfactory for some purposes as andalusite. Experiments show that it can be used satisfactorily, however, in the manufacture of refractories for uses

requiring extremely high-heat duty and low coefficient of expansion.

Deposits of cyanite have been found in the crystalline rock areas of Virginia, North Carolina, Georgia, and Alabama. Most of these deposits are small, although some of them may prove to be of economic importance. A large quantity has been mined in Arizona. Considerable massive cyanite has been imported into the United States from India, where it is said to occur as large, well-rounded boulders which have been transported from their original undiscovered source.

The cyanite deposits of Georgia are of two types: (1) Loose crystals imbedded in micaceous cyanite-staurolite-garnet schists; and (2) crystal aggregates associated with quartz in small and very irregular veins. The last type at first sight would appear to be the best source of supply. Large boulders or donniks of cyanite with more or less quartz are found on the surface at places throughout the Piedmont Plateau and the mountains of Georgia. But so far prospecting has failed to disclose a sizable vein at any of these places. It seems likely that these donniks may be a surface accumulation from small veins or miniature lens-shaped masses not over a foot in thickness and with a horizontal extent of not more than a few feet. The larger surface accumulation of cyanite donniks may prove to be marketable, but it now appears doubtful if a vein large enough to mine will be found. Deposits of this type have been noted near Woodland in Talbot County, northwest of Carrollton in Carroll County, in the northwestern part of Habersham County, in the Gumlog District of Union County, in Fannin County north of Hemp, on Hothouse Creek, and near Sugar Creek, in the Boardtown District of Gilmer County, near Refuge Church in Pickens County, and west of the L. & N. R. R. between Keithsburg and Ball Ground in Cherokee County.

Deposits of disseminated cyanite crystals in mica schist are known at two places northwest of Clarksville in Habersham County and near Ball Ground in Cherokee County. They are usually marked by a surface accumulation of flat cyanite crystals averaging an inch in length, half an inch in breadth, and a quarter of an inch in thickness. These crystals are darker in color than the massive cyanite, due, perhaps, to surface stain from the weathering of the schist in which they are enclosed. They represent the accumulation of the cyanite from several feet of the eroded schist, the mica and the sand having been washed away leaving the heavier cyanite crystals behind. The cyanite in the schist ranges in size from minute needles up to flat crystals two inches long, an inch across, and three-eighths of an inch thick. They appear to be arranged with the flat surfaces roughly parallel to the schistosity of the rock. Tests from one of these properties are said to show that the schist averaged 12 per cent by weight of cyanite.

A small washing mill has recently been put in operation to recover the surface accumulation of loose cyanite crystals on one of the Habersham County deposits. The top soil containing the loose cyanite crystals is shoveled into a flume which carries it to a small tumbling mill which separates the adhering impurities from the crystals, and to a screen which removes the sand, clay, and mica. Tests are under way toward recovery of the cyanite from the schist. The method of recovery will probably be by crushing and a gravity removal of the mica and quartz, followed by a magnetic separation of the garnet and staurolite from the cyanite. Impurities adhering to the cyanite crystals may have to be removed by tumbling in water or some other means. It is possible that considerable flake mica of good color can be recovered from the schist and sold to the roofing trade. A plant of this type would furnish a market for the donnicks of massive cyanite from the nearby territory. Iron-stain and iron-bearing minerals must be carefully avoided as they would lower the fusion point and cause bad black spots. The surface of the massive cyanite donnicks is sometimes badly iron-stained from the weathering of the surrounding schist. This coating must be removed before the cyanite can be used.

Further research will probably increase the demand for the sillimanite group and related minerals for use in high-grade refractories. Such research should also include studies of high-alumina refractories made from the kaolins, bauxitic clays, and low-grade bauxites of Middle and South Georgia.

National Forest Road Construction in Georgia

In apportioning \$5,000,000 as emergency funds to be used for highway construction in national forests for the fiscal year ending June 30, 1933, Georgia receives \$11,739 which will be used on the Georgia sections of the Cherokee and Nantahala national forests. Apportionments to other states are as follows: Alabama receives \$4,811, Florida \$20,403, North Carolina \$17,435, Tennessee \$15,028, South Carolina \$1,976, Virginia \$19,055, Louisiana \$2,390, Mississippi \$1,967, Oklahoma \$3,844.

New Uses For Cottonwood

A tree found throughout the south is being promoted by the Cottonwood Division of the National Association of Wood Box Manufacturers. An asset of cottonwood, especially for packing foods, is that it is odorless.

Recently, cottonwood has been successfully judged to make insulation for refrigerators. It has also been found to make good pulp board and filler to go between better-grade pasteboard in paper cartons.

MAKING FIRE BREAKS— METHODS EMPLOYED

Breaks Should Be Made and Renewed as Soon as Leaves Have Fallen and Grass Is Dry.

The greatest forest fire hazard in Georgia is in the winter and early spring. If this period of the year is dry, the danger is great; if it is wet, of course, the danger is decreased. It, however, behooves every timber owner to use fire prevention methods and be ready at all times to combat fires.

An essential to any well protected forest area is a fire break. A fire break is what its name implies. When a forest fire gets under headway, these fire breaks are important in restricting the fire to small areas.

In case of ordinary fires, the fire break stops the progress of the flames. In the case of fires driven by high winds, burning embers may be blown across a fire break, in which case the break is ineffective. But they can be made quite effective against wind driven fires as bases for back firing. The back fire broadens the fire break to an extent that flying embers cannot leap across. The back fire usually progresses against the wind and does not develop dangerous flying embers. At any rate, the fire break affords an important base from which to fight fires.

Where it is possible to make a plowed fire break, it is the most effective and economical to use. In South Georgia tractors and special plows are used to make such breaks. After these plowed breaks are made they are cheaply renewed each year with disc harrows.

Some of the large timber owners plow furrows several feet apart and then burn out the strip between to make a fire break, but careful check of costs show that this is more expensive to make than solid plowed breaks. In some cases, those burning off this type of fire break let the fires get out of hand and spread into the forest.

Another type of fire break applicable to small areas and used especially in the mountains where plowing is impractical, is the raked fire break. Rakes, hoes, or other scrapers are used to draw from a strip leaves and combustible material, leaving the ground bare. This type should be made after the leaves have fallen. The leaves should be drawn to the side where prevailing winds will not blow them back on the strip.

It is important that dead snags on both sides of a fire break be cut down. When these snags catch fire, they are likely to burn for some time and wind often carries live embers from these burning snags across fire breaks to start new fires.

Another type of fire break not often required, is used in peat filled swamps.

During prolonged and extremely dry seasons, the swamps dry up and their soil becomes combustible. To stop soil fires the best method is to dig ditches and cut down dead snags that are likely to scatter fire. But trench breaks need not be made until the exceptionally dry season comes and then usually the ditches can be dug ahead of the fire, which, as a rule, progresses slowly.

ON THE FIRING LINE

Forest fires today make tomorrow's pocketbook lean.

Fire keeps forest wealth from growing to full profits.

Take an interest in your forest if you want it to pay interest.

Each year thrifty trees grow new wealth for you. Do not let fire stunt the growth.

Less fire in the forest, more wood in the tree.

Burning off the land impoverishes the soil and the landowner.

A fire break is a fort from which to attack fires.

Pine seedlings are our future pine forests. Fire kills the baby trees as Herod killed the human babies.

Woodsman's Manual

A new and revised edition of "Woodsman's Manual" by Austin Cary has been issued by the Harvard University Press, Cambridge, Mass. It has been characterized by American Forests as indispensable alike to the field man and student.

The Manual treats of all branches of timber work, including timberland surveying, the making of forest maps, surveying of wood and logs, methods of estimating timber, how to reckon the growth of timber, and much useful miscellaneous information.

The author, Dr. Austin Cary, is well known in the south, particularly for his studies of pines in relation to naval stores production.

Amber Glasses for Fire Detection

Amber glasses are a part of the regular equipment of towermen in Maryland as a result of tests made by G. E. Sigworth, towerman, in that state. It is claimed that through amber glasses one can distinguish forest fire smoke more clearly from haze or cloud formation. Besides, the colored glasses relieve eye strain from the glare of a bright sun.

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No. 1

FRANKLIN D. ROOSEVELT AND CHARLES H. HERTY SPEAKERS AT GREAT FORESTRY MEETING AT WARM SPRINGS

Meriwether Timber Protective Organization Hosts to Large Gathering—Prominent Leaders From All Parts of the State—Forests for Land Utilization Emphasized by President-Elect Roosevelt—Utilization of Thinnings and Waste Timber for Paper Stressed by Dr. Herty, Who Exhibited White Newsprint Paper Made at Savannah Research Plant.

Those who attended the forestry meeting sponsored by the Meriwether Timber Protective Organization held at Warm Springs November 29, were enthused by the inspiring addresses delivered by President-elect Franklin D. Roosevelt and Dr. Chas. I. Herty, research chemist in charge of paper research in Georgia.

The meeting was largely attended by leaders in forestry and in public affairs coming from all parts of Georgia. The mes-

Formation of Local T. P. O.

The meeting was opened by Mayor Ed B. Doyle of Warm Springs, who introduced Rev. W. G. Harris for the invocation.

Mr. Doyle told of the formation of the Meriwether Timber Protective Organization in 1930 when Governor Roosevelt and State forestry officials addressed a meeting, resulting in the formation of the organization. Soon after the initial meeting 8,000 acres were signed up and later the area was increased to more than 10,000 acres.



President-elect Franklin D. Roosevelt Appearing on the Platform at Warm Springs to Speak on Forestry—Greeted by a Large and Enthusiastic Audience

Mr. Doyle introduced Miss Wilkins, donor of the tower. He then presented the officers of the Meriwether T. P. O.: A. S. Persons, president; E. L. Key, vice president; Stuart Stout, secretary-treasurer; Claud Botts of the "Foundation," and other members. He then presented District Forester W. G. Wallace of Columbus, who characterized the meeting as missionary in nature and valuable to the extent that the things learned about the better care and use of forests are put into practice.

T. G. Woolford Presented

Mr. Doyle then presented T. G. Woolford, Atlanta, president of the Georgia Forestry Association, to introduce visitors and speakers. Mr. Woolford congratulated the Meriwether Timber Protective Organization on its good showing and for the splendid audience assembled. He presented members of the Commission of Forestry and Geological Development in attendance: C. B. Harman, Atlanta; Alex K. Sessoms, Cogdell; Leonard Rountree, Summit, and J. M. Mallory, Savannah. Bonnell Stone, Development Agent; B. M. Lufburrow, State Forester, and Dr. Chas. H. Herty, Research Chemist, were introduced as heads of the department staff in attendance.

Representatives of the executive committee of the Georgia Forestry Association, not previously presented, were introduced. They were as follows: Jack Williams, Waycross; J. Phil Campbell, Athens; Joseph A. McCord, Atlanta; Miss Emily Woodward, Vienna; B. C. Milner, Atlanta; W. H. Key, Monticello, and Gordon Reynolds, Albany.

Prominent educators introduced were: Chancellor Snelling, of the University system; H. P. Stuckey, director of the Georgia Experiment Station; Prof. Paul Chapman, director of vocational education of the state; Prof. Gordon Marckworth, in charge of the School of Forestry of the State College of Agriculture.

Other prominent visitors recognized were: Hon. Hal Stanley, Commissioner of Commerce and Labor of Georgia, and Judge M. J. Yeomans, State Attorney General-elect.

...e of Governor Roosevelt on the place of forestry in land utilization and of Dr. Herty on the bright prospect of new uses of Southern pines in making white newsprint paper were heartening to friends of forestry.

Fire fighting equipment was purchased and a fire tower, donated by Miss Georgia Wilkins of Columbus, was erected by the county commissioners under the direction of Mr. Arthur Carpenter of the "Foundation."

(Continued on Page 2, Column 2)

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VOLUME THREE

With this issue of the Forest-Geological Review, the third volume begins. This publication, with its predecessor, the "Forest Lookout," has appeared monthly for two years. With the reorganization of departments of the state, forestry and geology were combined under the Department of Forestry and Geological Development, and the present title of this publication was adopted. A third division, that of paper research, was created. Therefore, the Review has undertaken to serve forestry, geology and paper research. With what success this service has been rendered, is for the readers to say.

Enough favorable reaction has, however, been observed, to warrant the belief that this publication has served a useful purpose and the third volume is undertaken in the hope of making this publication more useful in promoting the great resources of the state it represents.

Walnuts for Sale

Anyone desiring black walnuts for planting should get in touch with C. H. Barker, vocational teacher at Gore, and F. B. White, agricultural vocational teacher of Georgia Industrial College at Barnesville. Students of these schools collected the seed during the fall of 1932.

Among the experiments being made by the United States Forest Service to combat the chestnut blight, is the crossing of the American chestnut with the chinquapin.

ROOSEVELT, HERTY

(Continued from Page 1.)

Dr. Chas. H. Herty's Address

Mr. Woolford, in presenting Dr. Chas. H. Herty, told of Dr. Herty's great service years ago in saving the naval stores industry by introducing the Herty cup system; and now he has shown that white newsprint can be made of Southern pines, and as research chemist in charge of the state paper plant in Savannah, is working out technical and commercial aspects of manufacturing paper. He said Dr. Herty was there to tell about the progress of this work.

Dr. Herty sketched a history of his undertaking, telling how it was generally thought that Southern pines were unfit for making white paper because of their resin content, overlooking the fact that sapwood



Governor Roosevelt Speaks Earnestly
in Behalf of Forestry

contained no more resin than red spruce commonly used, and the fact that until Southern pines are 25 to 30 years of age they do not begin to store gum and make heartwood. Since virgin or heart pines have been cut and the pines we now have are nearly all sapwood, therefore the great opportunity in the South of making white newsprint and book paper from pines.

He made clear that paper mills could draw upon the forests of the South without hindering the development of naval stores or saw timber. This he said could be done by using forest thinnings for which there is practically no market; by using trees unfit for lumber, and by using tops of trees the lumbermen now leave in the forest to rot. He had on display a trunk of an old field pine with many limbs, unfit for lumber but still suitable for wood pulp. Dr. Herty displayed sections of pine trunks showing the absence of heartwood and sections of pines of equal or smaller

diameter of old trees containing heartwood and unfit for white paper, the latter representing the slowing down of tree growth due to fire. He emphasized the necessity of keeping fire out of the woods to get abundant, quick growth of sapwood for paper pulp.

A roll of beautiful white newsprint, made of a combination of chemical and mechanical wood pulp from Southern pines was exhibited, which he said was equal in every respect to a great part of the paper used by Georgia newspapers. He said, however, he expected to work out the problem of greater tensile strength and make a superior product from Southern pines. Samples of the paper made at the Savannah plant were distributed.

Dr. Herty called attention to the fact that Southern forests grow wood faster than the red spruce forests, the present source of supply, and added that much of the newsprint used in Georgia comes from abroad. To be economically independent of outside sources of newsprint he considered vitally important to this country. The South, he said, holds the solution in not only its vast pine forests, but in its deposits of sulphur, clay, lime, naval stores and other materials used in paper manufacture. The easy access of wood to Southern mills and the nearness to the great paper consuming markets, he held, added to these advantages.

The progress of research at the Savannah plant, he said, had more than exceeded his expectations, but there is much data yet to be worked out that paper manufacturers desire before investing in mills in the South, and this information he fully expected to obtain.

Governor Roosevelt Heard

Mr. Woolford stated that no introduction was required, that all he needed to say was "President-elect Franklin Delano Roosevelt."

Governor Roosevelt was given an ovation and began his remarks by saying: "I shall make you no formal speech. What I shall say shall be just a talk to people who are interested in things in which I am interested. I have been most pleased with the progress of forestry in Georgia."

While serving in the New York legislature, he said, he was made chairman of a committee on conservation and the first man to come before the committee was Gifford Pinchot, then United States Forester, who told of erosion taking place in the Adirondacks. His committee was able to get an appropriation of \$40,000. This was the beginning of his first serious thought about forestry.

He spoke of an undertaking in New York which calls for plating every 100 acres in an effort to eliminate sub-marginal lands from cultivation, the State purchasing these lands for reforestation. About 4,000,000 of the 18,000,000 acres of farm land are expected to be taken from cultivation in this manner. Mr.

profitable agriculture, fewer and better schools and less road cost to the State were expected as a direct result. The \$10,000,000 to be spent by the State on this project, he thought, would be repaid by forest products and in the savings mentioned.

"Other nations for years," he said, "have been practicing the raising of tree crops and have been making money out of it. One city in Germany is maintained by the revenue from a city-owned forest.

"We have figured that we can treat tree crops very much the way we treat cotton, corn and wheat crops and perhaps without the fluctuations in prices which seriously affect these other crops.

"When every acre of land in every State in the Union is put to the best use for which it is fitted, there will be far less danger than now of overproduction on some lines and underproduction on others; and then there will not be so much hit-and-miss about our economic policy."

The program of a notable forestry event in Georgia was thus brought to a conclusion.

GOV. ROOSEVELT'S FOREST POLICY DEFINED

In answer to an inquiry of Miller Freeman, publisher of "West Coast Lumberman," President-elect Franklin Roosevelt gives a general outline of his attitude on forestry from which the following is taken:

"Apart from the present emergency, I think we need a more definite and comprehensive national plan for protecting, conserving and enlarging our forest resources. This plan should have among its objectives more effective stabilization of the forest products industry. The excellent program adopted this year by the Society of American Foresters needs to be trans-

"LIGHT BURNING" AN EXPENSIVE PRACTICE

Reduces Productivity of Trees, Kills Seedlings, Damages Soil, and Is Often Ineffective in Fire Control—Better Methods Advised.

Throughout the naval stores belt of the South the practice of raking around the cupped trees and following with light burning, is widely practiced for protecting the cups containing gum.

Various estimates have been made of the cost of this practice, running from 25 to 50 cents an acre. It is not only expensive in labor cost but the permanent damage to the forest is much greater.

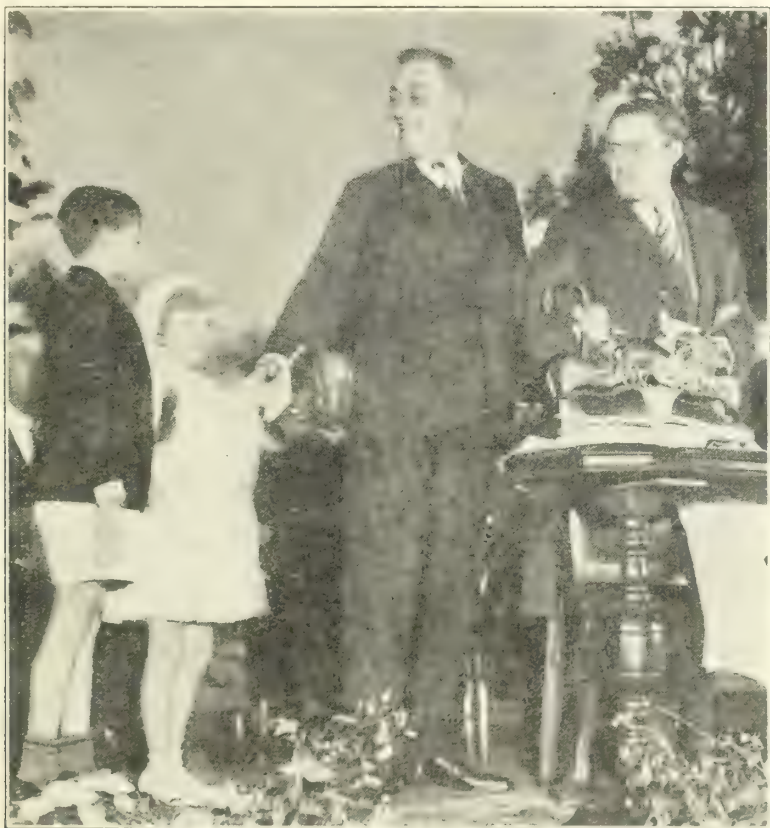
A number of timberland owners in Georgia who chip their trees, do not follow the practice of "light" burning. Reference is made to members of the Georgia Timber Protective Organization. Their methods are very effective in fire prevention and the total cost of fire control averages from 4 to 10 cents per acre, of which cost they get reimbursement from state and federal sources amounting to as much as 50 per cent.

Operators on land protected at a net cost of 2 to 5 cents per acre can, of course, produce gum cheaper than operators who pay 25 cents or more per acre for protection.

Some turpentine operators may wonder if there is any effective method under their conditions as cheap as raking and burning. The record of Timber Protective Organizations in the turpentine belts of Georgia show that on a 5-year average the acreage burned over annually is less than 1 per cent. Greater care, of course, is taken to keep fire out of the turpented areas of these T. P. O.'s, and the actual burned area is less there than 1 per cent; in fact, the protection is practically 100 per cent effective.

Firebreak construction, patrolmen, organization of fire fighting crews and fire fighting equipment, such as are employed by the Timber Protective Organization, are an effective and much cheaper method of forest fire prevention than raking and burning.

It is, of course, not possible for every turpentine operator to get leases on lands controlled by Timber Protective Organizations, but there is no reason why any turpentine operator cannot employ the kind of fire protection methods used by these organizations. Some who had been burning but were afraid to do so during the drought last year, also because production had to be held down by reason of low naval stores prices, got by very well and cheaply by using the patrol system. Add to this firebreak construction, and these operators can go on safely without burning.



Roosevelt Graciously Accepts Deed to Oak Tree from Grandchildren of the Donor at Warm Springs

Deed to Oak Presented

At the conclusion of Governor Roosevelt's address, a deed to a large, beautiful oak tree at Warm Springs was presented as a gift by Mr. and Mrs. Albert Barnes. Their grandchildren, Eugene Brown, age 11, and Sarah Brown, age 6, made presentation talks. Governor Roosevelt expressed his appreciation of being the owner of such a magnificent tree and of the sentiments which prompted the gift.

lated into more effective, coordinated action by individual forest owners of the several states and the nation. We need also, as I have stated on other occasions, a soil survey of the entire nation and a national land-use program. This has an important bearing on reforestation which must be jointly a State and Federal concern, but with more effective engagement from the Federal government than it has received in the past."

"Light" burning is a misnomer. All turpentine operators know that unless all the debris is burned off the forest floor, there is still danger of fire. Effective protective burning, and the kind generally practiced, is heavy burning and not "light" burning.

The damage to the forest from raking and burning so far as the turpentine operator is concerned, is that which follows the effect of fire on the soil. The roots of trees, of course, extend far beyond the area raked around the tree. The burning destroys the humus of the soil which, of course, makes the soil leachy so that it does not hold enough water to meet the needs of a healthy, growing tree, and the soil is left bare to wash, losing in this way the mineral plant foods left on the surface in the ash of the burned material. The direct consequence is "dry faces," many more than would occur if there were no burning. Another direct result is reduced gum flow, for whatever reduces the vitality of a tree lessens gum production.

In addition, burning off of the forest kills seedlings and small stuff, and the trees the fire does not kill are stunted in growth. The operator who burns is, therefore, cutting off future crops.

Not all turpentine operators are careful to control their fires. Not a few widespread fires in Georgia in 1932 were started by turpentine operators to protect their crops and then were allowed to get away into other forest lands. This, of course, would not have occurred if the operators had not used fires to prevent fire.

The sooner Georgia turpentine operators get to using firebreaks and other protective measures and abandon raking and burning, the sooner they will be earning greater profits for themselves and allowing forests to come along in the best shape for future crops.

Whipping and Damage Forest Fire Penalties

In 1676 the Duke of York, brother of King Charles II of England, made the penalty in Pennsylvania for kindling a fire in the woods and permitting it to escape to cultivated land, the payment of all damages plus one-half more as a fine. If the guilty person could not pay, he was liable to receive "not exceeding twenty stripes," in other words, be publicly whipped. *Journal of Forestry.*

Based on the percentage of renewals for the 5-year period ending with 1930, an average life of 23 years for creosoted ties was reported by seven railroads. Some of the ties were sound and in service after 44 years. —*Forest Worker.*

From 41 to 5 per cent of the lands of Arkansas are estimated to have reverted to state or counties for taxes. The United States Forest Service considers that this is typical of Florida, Georgia, Mississippi, Louisiana, Alabama, Oklahoma and Texas.

TREE SEEDLINGS SELL RAPIDLY IN GEORGIA

Supply of State Nurseries Rapidly Sold Out to Landowners — Gratifying Interest Shown in Reforestation.

Practically all of the seedlings grown at the State Tree Nurseries located at Albany and Blairsville have already been sold to land owners in the state for planting. All of the longleaf, shortleaf, loblolly and white pine, black locust and black walnut seedlings have been sold, leaving only some slash pine at Albany available the middle of December. The sales have amounted to approximately three-fourths of a million seedlings.

The two nurseries were not established until May of this year, and the output of seedlings is not as large as the Division of Forestry expects hereafter.

The state forester is gratified with the readiness with which purchases have been made in view of the low purchasing power of farmers. The record this year indicates a growing interest in planting abandoned farms and sub-marginal lands to trees in the state. It is believed that the movement toward reforestation will increase and the demand on the state tree nurseries will be larger in the future.

The sale of seedlings by the state nurseries does not measure the extent of planting in the state. Many land owners are transplanting wild seedlings of the forest to open lands, and those seeking tree seedlings from the state nurseries and finding the supply exhausted, are purchasing planting stock from the tree nursery of the School of Forestry at Athens and from vocational school nurseries. It is impossible to accurately estimate the number of seedlings obtained from other than state nurseries, but it is thought that it is not unreasonable to expect that three to four million pine seedlings will be planted in Georgia between October 1, 1932, and May, 1935.

Seasoned Staves for Rosin Barrels

Formerly staves for rosin barrels were purchased in carlots and before they were made into barrels they had time to season. But in these days consumers buy in smaller lots and the staves are used before they have time to season, with the result that when the hot rosin is poured into the barrels they shrink and leaks result.

C. F. Speh, secretary-treasurer of the Pine Institute of America, has received complaints of this condition and Mr. Speh, in turn, has given publicity to the plea that stave manufacturers cut their materials long enough ahead to allow them to season before they are marketed.

It is probable that consumers will be more discriminating in the future in the kinds of staves they buy.

NEW HOPE AROUSED FOR NAVAL STORES

Demonstration at New Naval Stores Experiment Station Largely Attended—Important Revelation.

The "Naval Stores Review" makes this interesting comment on the dedicatory exercises of the U. S. Naval Stores Experiment Station at Olustee, Fla., held November 12:

"A new naval stores industry of the future is promised by the large brick-steel building, in which will be carried on the studies on new stills, etc., new methods of producing existing rosin and turpentine products; development of new uses.

"The industry is interested in these efforts to help as evidenced by the nearly 500 people—distributors, factors, timber owners, but chiefly producers, who attended the exercises. They saw runs made on the fire still, new methods of handling the crude gum and final products. They saw careful straining producing a clean rosin and they saw good cooperage. They also had the opportunity of seeing a display of various types of new and treated cups; they saw an exhibit of the Research Forest, showing that it took 800 four-inch trees to make a barrel of turpentine, as against a much smaller number of the large trees. They saw how rusty cups and aprons can give H rosin instead of WW. They saw these things and many more. They should have seen hope; hope for a new industry, an industry that is profitable."

BUSINESS READJUSTMENT ADVOCATED BY C. B. HARMAN

In a November issue of the *National Glass Budget*, C. B. Harman, forestry leader of Georgia, has an article that has attracted much favorable attention. Excerpts are given herewith:

"We are not depressed; we are exactly where we belong. . . . We are 100 per cent better off than we were 32 years ago. . . . It is my opinion that the depression was over more than a year ago and that the problem now facing us is, how can we become adjusted to a normal condition, most suitable to the situation in which we may expect to live during the next 10 to 20 years? . . . If we aim to restore that high-pitched position of a few years ago, we are just fooling ourselves.

"During inflated times we adjusted our capital and facilities to fit the demand. Now in deflated times we must do the same and there can be no other side to it."

Mr. Harman advocated a small per capita tax, a general sales tax, income, inheritance and license taxes and the abolition of all ad valorem and like taxes. Such a system he considers would take care of the needs of the county, including reforestation.

FORESTRY QUESTION BOX

How do oaks and other trees bearing heavy nuts extend their domain?

Oaks, hickories, chestnuts and a number of other bearers of heavy nuts are at a disadvantage in scattering their seed as compared to pine, ash, yellow poplar, maples and other trees having light winged seed. Trees with heavy seed doubtless owe their spread beyond the reach of the tree limbs to the providence of certain animals, especially squirrels. These animals carry nuts in their mouths sometimes quite a distance, scratch out a hole and bury them. Presumably this is a cache of food for future reference, but apparently they forget all about the burying place, and the seed, having thus been nicely planted, come up and grow a nut tree in a new area. An interesting question is, Do squirrels bury the nut for food, or do they bury it to grow into new nut bearing trees that their future supply of food may be assured?

Do caterpillars kill trees?

The forest tent caterpillar (*malacosoma disstra*) has been known to so severely injure forest trees by complete defoliation in May and June, as to kill trees. The damage is greatest on dry sites.

How much of the rot of hardwood can be attributed to fire scars?

In the yearbook *Agriculture*, 1926, G. G. Hedgecock states that as high as 19 per cent of the volume of eastern hardwoods is often lost through decay, of which more than 90 per cent of the basal or butt-rot type enters through fire scars.

The Forest Products Laboratory reports results of studies in the Pisgah National Forest in North Carolina which show 17 per cent of all defects in red oak are due to fire; chestnut, 20 per cent; bass wood, 8 per cent.

What makes swellings or "cancer" on pines and what is the remedy?

Dr. B. B. Higgins, botanist of the Georgia Experiment Station, identifies specimens submitted as evidence of a rust (*crotonium cerebrum*). He explains that the swellings caused by the rust are covered in the spring with yellow pustules of the rust. The mycelium, or rootlike growth of the rust, lives throughout the year in the wood tissue and produces spores every spring for a number of years. The spores of the pine are one stage; another stage appears on oaks.

The only practical method of control is to remove diseased pines and oaks, and to remove those species within 200 feet of the infected trees. The disease is most prevalent in low, swampy woods of mixed pine and oak stands.

Does burning the woods reduce the number of pine beetles?

Instead of reducing the number of pine beetles, forest fire creates conditions favorable for the increase of beetles. Whatever reduces the vitality of a tree makes it more susceptible to beetle damage. Fires create this favorable condition. It is well known to anyone who observes the beetle's habits, that it attacks weak trees and is more prevalent where forests have been burned over than in forests where fires have been kept out. Fires do not destroy pine bark beetles. Those burned in logs are other comparatively harmless insects.

HERTY MEDAL FOR RESEARCH WORKERS

Bestowed Annually by the Chemist Club of Georgia State College for Women at Milledgeville on Individual Achievement in Research.

In recognition of Dr. Charles H. Herty's contribution to chemical research, a medal to be known as "Herty Medal" is to be awarded annually by the Chemical Society of the State College for Women at Milledgeville to the person in the South doing outstanding research work.

The first award will be made in May of this year. All men and women engaged in graduate study, in teaching or in industrial laboratories of Virginia, West Virginia, Kentucky, Tennessee, Mississippi, Alabama, Georgia, Florida, North Carolina and South Carolina are eligible to compete.

The chairman of the American Chemical Society of each section will be requested to name three candidates for each state, sending these names to Dr. Samuel Guy, Emory University, by April 1. Award will be made at the May meeting of the Georgia section held at Milledgeville.

Fowler to Plant Slash Pine

James Fowler, a member of the Treutlen T. P. O., plans to plant another 100 acres to young one-year-old slash pine during January, 1933. Mr. Fowler has planted over a million slash pine seedlings since 1926 on worn out and abandoned farm land. He plans to use nursery stock from the state nursery at Albany and woods grown stock which he will lift and transport to the planting site as he needs them. He has obtained a good survival in the past using both kinds of planting stock. On several occasions the survival has run as high as 98 per cent.

Burning Stumps Under Air Blasts

In British Columbia stumps are quickly and completely burned by starting flames with air blast created by a portable machine. It is claimed that stumps are removed more cheaply by this process than by dynamiting or pulling up by tractors.

FIRST DISTRICT

W. D. Young, District Forester
Rome, Ga.

Extracts of Letters From a Patrolman

November 19th.

Mr. W. D. Young, District Forester,
Rome, Ga.

Dear Brigham:

Arrived in the big city of Alpharetta at 11:30 A. M. last Wednesday, the 15th. Had to wait until 8:30 for the owner of the "Rolls-Royce" to show up so I could hand him over the 15 bucks and make myself a member of the Amos and Andy Fresh Air Taxi Company. The car has no top, but runs pretty good for the shape it is in. However, the landlady has to loan me about 20 gallons of hot water every morning to pour over the motor so I can crank it.

November 26, 1932.

I really enjoy my work. Mr. Elkins, the vocational teacher at Alpharetta High, and myself are going to have a meeting each night next week with the farmers. All the leaders I have talked to so far are responding with enthusiasm. Hope to do something worth while.

Had a 12 acre fire on Mr. Shaw's property last Wednesday. I had just gotten through working on my Ford and was on my way back to Alpharetta from Ocee when I saw the fire. Believe you me, I really checked out for that fire. It took me and the two Shaw brothers about three hours to put it out.

P. S.—Had to go to Atlanta Saturday afternoon to get gas tank repaired. Burned too much gas last week.

December 4, 1932.

Mr. Elkins, the vocational teacher, and I worked like the very devil every night last week, organizing the Forest Fire Fighters. We had good luck every place except Newtown. The farmers there wanted more time to think it over. The way we worked up the meeting was successful. I visited the prominent landowners and urged them to attend and bring along some friends and neighbors. Mr. Elkins and I made short talks and then had a general round-table discussion of the F. F. F., after which all who were willing signed up.

Mr. Elkins and I allowed some energetic farmers to join who owned no land, but who were willing to help in stopping fires. Did we do the wrong thing or not? Please send me some more contract forms and plenty of copies of fire law and "Why Prevent Woods Fire." It is as good as convenient.

December 17, 1932.

I received your letter yesterday and am glad to know that you think well of our methods of organizing.

We were successful with our meeting last week. Five organizations are in process of being formed in "Old Milton." We held meetings at Ocee, Birmingham, Crab Apple, Alpharetta and Newtown. Since writing you last, the Newtown district has come around and I have signed up 2300 acres.

The organizations vary in size and the total area signed up at present is 5329 acres, and I have hopes of increasing the signed acreage of every one.

Sincerely yours,

HAM RASNAKE, Patrolman.

P. S.—Ole Amos and Andy "Rolls-Royce" is still clicking on all four.

SECOND DISTRICT

Everett B. Stone, Jr., Dist. Forester
Gainesville

Fire Protection Measures

Two new forest fire fighting organizations have recently been organized in the Gainesville district. One of them, known as the Glades Forest Fire Fighters Organization, is located in Hall county and embraces approximately eleven thousand acres with some fifteen owners. The second, known as the Commerce Forest Fire Fighters Organization, covers land located in Jackson and Banks counties and embraces approximately twenty-one thousand acres with more than thirty members.

These organizations will be given assistance by the State through the services of forest fire patrolmen and are the beginning of what is planned to be a widely located series of such units throughout the district, which will influence landowners in fire protection and greatly bring about the complete control of the forest fire situation.

Owing to an abundant and well distributed rainfall there have been very few forest fires throughout north Georgia this fall. Only a very few fires have been reported, and even on days when fires would burn there seems to have been very few. Apparently people who are using the woods are interested in preventing the starting of forest fires.

One of the heaviest snowfalls for several years is covering most of the district at this date and there seems to be no danger of any forest fires occurring during the remainder of the calendar year.

First State Forest Deeded

The deed for the state forest of 100 acres donated by the heirs of the Nixon estate and located near Augusta in Richmond county, has been duly recorded and the state of Georgia has come into possession of a state forest, the first of its kind. Other forest areas owned by the state have been acquired as forest parks.

FOURTH DISTRICT W. G. Wallace, District Forester Columbus

President-Elect Roosevelt and Dr. Charles H. Herty Address Warm Springs Forestry Meeting

The forestry meeting at Warm Springs on November 29th was probably one of the most successful forestry meetings ever held in Georgia. Mayor E. B. Doyle of Warm Springs gave a brief history of the Meriwether County Forestry Fire Prevention Organization. It was disclosed that President-elect Governor Franklin D. Roosevelt was the first to propose this organization, and was the first person to sign up as a member about three years ago. The organization and its system of protection was later perfected when Miss Georgia Wilkins of Columbus, in the fall of 1930, donated an eighty-foot steel fire lookout tower to be erected on Pine Mountain as a memorial to the late Charles L. Davis.



Oak Tree Presented to President-elect Roosevelt

T. Guy Woolford, president of the Georgia Forestry Association, presided. Dr. Charles Herty, Research Chemist of the Division of Pulp and Paper Research at Savannah, addressed an audience estimated at close to one thousand. His talk on the possibilities of creating a market for second-growth Southern pines for making newsprint and writing paper roused his audience with an enthusiasm that will result in better management and protection of the pine forests of this state.

President-elect Roosevelt, due to other business, was unable to arrive until after Dr. Herty's speech. It was his only public appearance while in Warm Springs and the first public address following his election to the presidency. His appearance is considered conclusive proof of his intense interest in forestry.

Governor Roosevelt spoke for about one-half hour, stressing the point of proper land utilization. He described a land survey as one of the first essentials towards putting the lands to their best use. In a detailed description of the New York state forestry program he showed that a system of reclaiming marginal and sub-marginal lands to the growing of tree crops would reduce taxes and expenses in a number of ways. He went on to say that, "We will come to a time when we will put overproduction in some lines and underproduction in others behind us. Then we will have a more stable population with the same kind of advantages in the country that we have in the city."

Following the informal talk given by Governor Roosevelt, he was presented with the deed to a giant white oak tree, and the ground on which it stands, by Sara Elaine and Eugene, the small children of Mr. and Mrs. Eugene Brown. This great oak, which is 23 feet in circumference at the base, has been in the ownership of the Barnes family for 120 years. The grandmother of Mrs. Brown states that when she was a little girl around 85 years ago this great oak was practically as large as it is now.

G. I. C. and Hogansville Hi Vocational Students Hear Herty and Roosevelt Speak

Vocational Agriculture Teachers F. B. White and Claude Bray, of Georgia Industrial College and Hogansville High respectively, with more than fifty students, attended the Warm Springs forestry meeting held November 29. These students of vocational agriculture and forestry gave particular attention to the speech of Dr. Herty. The interest and attention of the Hogansville High students was proven when they easily passed an unexpected examination covering Dr. Herty's address. The G. I. C. students from Barnesville proved their interest by preparing detailed essays covering the entire meeting. Of course all students were greatly interested in the informal talk given by Governor Roosevelt.

It is well known that there were a few men and women at the meeting to see and hear the next President, but I am glad to say that these vocational students were interested enough in forestry to absorb Dr. Herty's speech with intense interest.

Cataula and Fortson Forest Fire Fighters Organize

Under the leadership of Forest Patrolman T. L. Colwell, two new Forest Fire Fighters' organizations have been formed, one being at Cataula in Harris county, and the other being at Fortson in Muscogee county.

The Cataula Forest Fire Fighters, with J. D. Thompson, president, and Charlie Ben Lynn, secretary-treasurer, has a total

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

MANGANESE, BARITE AND OCHRE, AND THE 16TH INTERNATIONAL GEOLOGICAL CONGRESS

GEOFFREY W. CRICKMAY,
Assistant State Geologist

In the middle of July, 1933, a group of scientists from all parts of the world will stop in Georgia to examine the ore deposits of the Cartersville district. The excursion to Georgia is one of many that, all together, will cover most of the United States. These excursions, together with sessions in Washington, comprise the 16th International Geological Congress meeting in America for the first time in twenty years. Each tour is limited in scope to a certain field and the objective is to cover this field as completely as time and conditions will permit. The group which will visit the Cartersville district will also consider typical ore deposits in the Mississippi Valley and the Southern Appalachian.

In the Cartersville district there occur deposits of manganese and iron ore, barite, and ochre which represent a variation of a type common throughout the Southern Appalachian. The diversity of deposits localized in this area makes it a particularly attractive field for the visiting geologists. The State Geological Survey has prepared a description of these Cartersville deposits to serve as a guide to members of the excursion and it will be published as part of the International Geological Congress Guide Book of the southern states. In this guide the extent and nature of the deposits are described and the several theories regarding their origin are reviewed. The mining and milling methods at the plant of the Manganese Corporation of America have been summarized in this volume by M. T. Singleton, Consulting Engineer, Atlanta.

The mineral deposits of commercial importance found in the Cartersville district include: The manganese minerals, pyrolusite, psilomelane, manganite, limonite, ochre, and barite. All of these minerals may be found together, although in any one mine usually only one is present in sufficient quantity to form an ore deposit. Manganese and iron ore are most common north of Cartersville; barite and ochre most common south of that town. Manganese oxides most commonly occur with limonite; in fact, all variations from nearly pure manganese oxide to equally pure limonite may be found, and their intimate association points to a common mode of

origin. Barite is most commonly associated with ochre and in places both are mined in the same open cut.

The scientists will examine mines showing typical deposits of manganese, barite and ochre. These visits have been arranged through the courtesy of the Manganese Corporation of America; Thompson, Weinman and Company; and the New Riverside Ochre Company.

It is a common idea of those unfamiliar with mining that ore deposits occur in a more or less fortuitous manner, and that predictions of conditions underground are highly speculative. Through years of patient toil, geologists have found that there are certain principles according to which ore deposits are formed, and that through a study of surface conditions, estimates and recommendations can be made for further prospecting and development. These principles are operative in the Cartersville district, and what appears to be a haphazard distribution of the ore minerals is actually determined by some local control. An understanding of the origin and nature of the ore bodies is a pre-requisite to intelligent prospecting; however, at the present time there is no complete agreement as to the origin of the Cartersville ore deposits. Concerning these deposits, geologists are asked: To what depth do they descend? Do they become richer in depth? Are they in continuous or discontinuous bodies? Are they associated with some particular geological formation? Any theory concerning the origin of these deposits should answer such questions as these.

As early as 1891 Penrose claimed that the manganese ores were in definite beds enclosed in the country rock, and were formed in coastal lagoons very much like certain iron oxides form in present day bogs. In 1901 Hayes showed that the distribution of the manganese ores is determined chiefly by chemical and physical conditions and not by outcrops of beds especially rich in manganese as postulated by Penrose. He also believed some of the ores to be due to the action of springs, possibly thermal, which brought minerals to the surface from deep within the earth. At a later date Watson reverted to the theory of Penrose, although he made certain modifications. His view was that the manganese and iron were deposited along with calcium carbonate to form a limestone, and with weathering away of the limestone the iron and manganese were left concentrated as residual deposits. Later authors have followed Watson, enlarging his theory to fit newly discovered facts.

Recent mining has disclosed much new information about the manganese deposits, particularly concerning the Bufford and Aubrey ore bodies near White, on the property of the Manganese Corporation of America. The ore deposits occur in unconsolidated sand, gravel, and clay situated on the lower western slopes of a prominent quartzite ridge. The enclosing material has evidently been transported, and has accumulated through hillside creep and landslides within comparatively recent time. The ore consists of boulders and pebbles of manganese with some hard concretionary masses of psilomelane and manganite. None of the theories of origin mentioned above explain these conditions satisfactorily, for it is apparent that the manganese oxides were formed elsewhere and transported to their present position, and are not residual accumulations overlying beds particularly rich in manganese.

The ore is mined by hydraulic giant operation in open pits. The high pressure water jet from the giants disintegrates the sides of the pit and sluices the ore mixed with clay and sand to a sump. A great amount of material can be washed down in this manner. From the sumps, the ore, with clay and water, is pumped in pipes to the mill where it is washed, classified, and separated into concentrates and tailings. The concentrates of manganese and ferro-manganese are used mainly in alloys with iron (steel), and to a lesser extent with other metals. Manganese also has a number of uses as a chemical and as a pigment.

Those who have driven along the Dixie highway near Cartersville, must have been impressed with the large scars in the surrounding hillsides. Inquiry would have revealed that these scars mark the location of barite and ochre mines, for in this section some of the largest deposits of ochre and barite in the United States occur. Less than ten years ago nearly \$750,000 worth of these minerals was recovered from these Cartersville hills in a single year. Since that time Georgia has to some extent lost its commanding position in the barite and ochre trade but a steady, if small, production has been maintained.

Barite (Barium Sulphate) occurs in deposits very similar to those in which manganese is found, that is, sandy clay deposits of limited thickness on the hillslopes. At the Paga No. 1 mine south of Cartersville, one of the most important barite mines, the ore occurs as a residual deposit. Barite is a soft, white mineral, the most distinctive characteristic of which is its high specific gravity. The chief use of barite is in the manufacture of paint; the mineral is also a source of Barium which has a number of chemical uses. Beautiful crystals of barite can be collected at the Georgia Peruvian mine near the Dixie highway bridge over Etowah river. The crystals occur in ochre ore and are known amongst the local miners as "flowers of ochre."

Ochre in the Cartersville district consists of a limonitic replacement of quartzite in the form of branched veins and irregular masses. At the Georgia Peruvian mine the ochre is in hard quartzite and has been mined by underground methods. At the New Riverside Ochre Company property, situated north of Etowah river and 1½ miles east of Cartersville, the ochre occurs in unconsolidated clay. These are not transported clays like those in which the manganese occurs but are residual, that is, they were formed in place simply by weathering or rotting of the underlying rocks. It is generally thought that the limonite was derived from oxidation of iron sulphides in the enclosing rocks.

The crude ochre from the mine is thoroughly washed and dried to remove impurities before it is pulverized ready for shipment. The refining process is most commonly carried on in large shallow tanks where the ochre is allowed to settle and dry. For final drying the ochre is placed on shelves under sheds. Ochre is used in the manufacture of linoleums and oil cloths. The best grades are adapted for use as a pigment in certain paints.

G. I. C. AND HOGANSVILLE HI

(Continued From Page 6)

of 2643 acres listed for fire protection. There are thirteen landowners in this organization. An added feature of the Cataula Forest Fire Fighters is the Cataula Junior Forest Fire Fighters, which is a group of boys and young men pledged to assist in the control and prevention of forest fires in their community.

The Fortson Forest Fire Fighters under the leadership of J. C. Moore, president; H. N. Smith, secretary, and L. G. Fortson, treasurer, organized with 5257 acres listed for fire protection. There are sixteen members in this organization, and it is expected that the acreage and membership will be more than doubled in the near future. This community has thousands of acres of abandoned land reverting to young pines that they realize will be a valuable source of income within the next ten to twenty years.

FIFTH DISTRICT

**H. M. Sebring, District Forester
Macon**

Falling Creek Fire Fighting Organization

Farmers and timberland owners met December 13 at Liberty school in the western part of Jones county and formed the Falling Creek Fire Fighting Organization. Six landowners, owning jointly 4,000 acres, were present at the meeting. Officers were elected and committees appointed to get others to join the organization. B. R. Jarrell, Sr., was elected president; F. S. Cline, vice-president, and T. H. Taylor, secretary-treasurer. The land listed in the organization lies in Jones county along

the Ocmulgee river between Dames ferry and East Juliette. The organization will hold its next meeting January 4, at which time the membership committees will report and the amount and distribution of fire tools will be decided upon.

Demonstration Forest Located for Fort Valley Normal and Industrial School

A forest demonstration plot has been surveyed and management plan made for the Fort Valley Normal and Industrial School. This is a colored school and some difficulty was encountered in securing a suitable plot. A colored farmer, Sharper Felder, has allowed the school to use 14 acres of his woodland for demonstration purposes. The plot does not have a full distribution of age classes but is the best that could be found, and will afford the school excellent opportunity to build up a good stand and teach the essentials of good forest practices.

New Bethel T. P. O. Formed

At a meeting December 15, the New Bethel Timber Protective Organization was formed in the corner of Telfair, Laurens, Dodge and Wheeler counties. Quite a number of the landowners in this section have been protecting their timbered lands, but were anxious to form an organization so as to get a better cooperative spirit in fire fighting work. The following officers were elected: H. E. Coleman, president; Thomas Pervis, vice-president, and G. F. Clarke, secretary-treasurer. The landowners plan to do their own firebreak work and dispense with a patrolman, as all men live on their own places and can cooperate with each other in looking after the fires. L. R. Lanier, secretary-treasurer of the Ocmulgee T. P. O., was present and told the men about the success achieved by members in that organization.

SIXTH DISTRICT

**Jack Thurmond, District Forester
Savannah**

Indigo Forest Fire Fighters Formed

On December 6, 1932, a meeting at Berryville school in Effingham county was held and the Indigo Forest Fire Fighters was organized, which includes 14 members with 4,500 acres of timber land.

W. B. Reiser was elected president of the organization and L. V. Gauley, the county agent in Effingham county, secretary-treasurer. The organization assessed each member ¼ cent per acre and raised \$33.00, which will be spent for five-gallon fire pumps to use in putting out fires when they start.

All of the land included in the organization is practically in one block and all the landowners in this little community are members, and are determined to aid each

other in suppressing all fires. An organization of this kind will aid all members to protect their young timber from fire in a cooperative way.

Treutlen T. P. O. Constructing Firebreaks

The Soperton Naval Stores Company and James Fowler, members of the Treutlen T. P. O., have been busy for the past two months constructing their firebreaks in order to be ready for the coming fire season. They use two-horse plows equipped with "Terrace Wings" and throw two furrows together, and about 30 feet away, put two more furrows together and burn out the intervening strip. All primary breaks are of the plowed and burned type and cost on an average \$4.00 per mile, while secondary breaks on the Treutlen T. P. O. are plowed solid about 10 feet wide and will cost more for the first year than the plowed and burned type, but after the second year they can be maintained with a two-horse harrow for \$1.50 per mile. The Treutlen T. P. O. has already constructed 400 miles of firebreak, the greater part of which is the plowed and burned type, and all the members plan to have all their breaks in and will be ready when the fire season comes.

SEVENTH DISTRICT

**C. Bernard Beale, District Forester
Waycross**

Accidental Fires Reduced

Up until the end of December, there had been very few fires in the Seventh Forest District this fall. Most of the fires that have occurred have been in areas burned off by turpentine operators prior to hanging cups. Accidental and malicious incendiary fires have been rare.

Out of the estimated 25,000 acres burned in this district, it is estimated that less than a thousand acres have been burned through accident and incendiary burning. Over 95 per cent of the land that has been burned this fall has been burned by turpentine operators and landowners themselves. It is probable that after January 1st, the amount of accidental and incendiary burning will increase, but it is anticipated that the greater part of the acreage burned during the next quarter will be on turpentine operations, raked, and many of them purposely burned.

Pierce Area Organized

An area of 13,000 acres has been signed up as the Pierce County T. P. O. W. J. Rich is president and A. E. Davis is secretary.

The members plan to put in firebreaks over the area and secure some fire fighting equipment. The area covers the northern part of Pierce county and approximately 50 landowners have signed up.

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MALARIA PROMOTED BY FOREST FIRES

State Board of Health Finds Malaria Worse in Drouth and Burned Regions of Georgia — Woods Fires Favor Breeding of Malarial Mosquitoes.

The State Board of Health of Georgia reports an increase in the number of malaria cases in sections of Georgia following the drouth and forest fires of 1931 and 1932. It is believed by the board of health that forest fires were an important factor in this increase by creating conditions favoring the breeding of the malarial mosquitoes.

It is pointed out by the board that the mosquitoes that transmit malaria breed in water that is neutral or alkaline, that they avoid water that is acid. Except in the limestone regions of south Georgia, swamp waters, in the absence of forest fires, are too acid to make breeding places for the malarial mosquito, though they breed other mosquitoes. As an example, Okefenokee swamp was carefully searched by federal men for larva of the malarial mosquito without success. The waters of the swamp apparently contained too much organic acids to suit that breed of mosquitoes.

It has also been found that the greatest number of malarial mosquitoes and the greatest number of cases of malaria coincide with the limestone belts of the state, showing that lime in solution in the water makes a condition favorable for breeding the malarial mosquito.

Why forest fires make swamps less acid and more favorable as breeding places of the malarial mosquito, is explained by the fact that the ash left by fires contains lime, potash and other minerals which enter readily into solution of rain water. This neutral or slightly alkaline water has filled up dry or burned swamps and created a condition favorable for breeding of malaria mosquitoes. The slow filling of dry swamps after a long drouth has probably favored the malarial mosquito more than in the absence of severe drouths. But the evidence seems to point to ash of burned woods leaching into swamps at any time as able to so modify the chemical condition of the water as to favor the breeding of malaria mosquitoes.

A PUBLIC APPEAL

An appeal is made by the State Forest Service to people everywhere not to set fire to their timberland and to use precaution burning fields or brush. A large acreage of young timber will probably be ruined or greatly set back in growth by fires, unless people can be made to realize that burning timber even in damp weather, can not be done without burning all needles off large saplings and killing outright the small seedling tree. People are urged by the Forest Service not to burn their land this year, and thus reduce the large economic loss to the State such burning annually causes.

The question might be asked as to whether the drying up of the swamps has not eradicated the natural enemies of the mosquito, notably fish. The answer to this is that in limestone regions, fish and other natural enemies of the mosquitos have never controlled the mosquito. Whatever effect the natural enemies may have the fact is that they are not now in the swamps that were dried up and therefore, can not be looked to for aid. It is claimed by foresters that fish have been killed in streams and swamps by heavy leachings of wood ashes left by forest fires. Lye from wood ash is not good for fish.

The conclusion is that burning off woods favors malaria by creating conditions favoring the breeding of the particular mosquito that causes malaria.

LARGE PLANTING OF TREES

Archie Turner of Brooks county is planting 150 acres to slash pines this year. His planting stock was obtained from the state tree nursery at Albany and assistance in the undertaking has been rendered by District Forester H. D. Story.

Thelma Naval Stores Company at Thelma, near Valdosta, has purchased 36,000 acres of land on the Clinch-Lowndes county line and operation of 26 crops will begin this season.

GA. MARGINAL LANDS FOR TREE PRODUCTION

Abandoned Farms and Lands Exhausted for Profitable Crop Yields, Useful Only in Growing Trees.

"Marginal land" is a term that has come to mean land not capable of being profitably used for agriculture. Marginal land may be land once used for agricultural crops but now abandoned and for the present, at least, not needed for producing food. It may also include badly eroded land no longer suited to farm crops; marshes, overflow land, rocky, steep and inaccessible lands, cut-over areas not reforesting, and range lands of low quality.

No survey has been made to determine how much marginal land exists in Georgia. Estimates vary from three to five million acres. Some land that might be termed unprofitable farm land during the country's depression would strictly speaking be "marginal land", but would not be so classed under normal conditions. Nor would any land that is unprofitable because of poor farm practice be rightfully classed as "marginal land".

More than 23,000,000 acres in Georgia are classed as forest and potential forest land. If 3,000,000 more acres were regarded as marginal land; this would make 26,000,000 acres available for tree growing.

The present back-to-the-land movement in Georgia, will probably increase the number of acres in crops but not enough to materially affect the total available forest land.

The cropped acres of each farm are now carrying the tax burden of idle or marginal lands, unless these idle lands are producing something the farmer will continue to handicap his productive acres. In some states, notably New York, a survey to determine marginal land areas is being made preparatory to the state purchasing such land for reforestation. This of course, is easily possible in a wealthy state like New York where it would not be possible in less wealthy states.

Some states are undertaking to encourage reforestation of marginal land by imposing only a nominal tax or by deferring

(Continued on Page 2, Column 1)

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tax collection till the forest crops are removed, this plan also applying to the states forest lands in general.

It is quite certain that investments made in marginal lands will never be recovered, not to mention becoming a source of income above investment, unless these lands are allowed to do what they can toward yielding forest products.

What species of trees to grow on marginal lands depends on the site, whether swamp land, stream banks, mountain crests, rocky slopes, down state or up state. The species most generally suited to all parts of the state are the pines. They are hardy, strong feeders on poor lands, rapid growers comparatively disease free and unsurpassed in varieties of uses. Generally speaking pines are best for marginal land.

If the lands are swampy the best plantings for quick results are the yellow poplar, cottonwoods, gums and for slower growth, cypress, white cedar and various hardwoods native to the section. If the site is along streams or in fertile hollows, yellow poplar, sweet gum, ash, walnuts or other hardwoods the land owner may elect, may be used. If in high altitudes the white pine and Virginia pine, loblolly pine, shortleaf pine on slopes; yellow poplar, ash, or other hardwoods in coves. Badly eroded land is better suited to pines than other trees.

The thing to do is to plant trees on these lands at once so that they can start producing something worth their keep; and once planted of course, they must be protected from fire.

STATE WATER SURVEY SOUGHT BY COMMISSION

Capacity of Stream Flow, Temperature and Chemical Analysis of Streams of Sufficient Volume for Municipal and Industrial Uses Desired.

A committee appointed by the Commission of the Department of Forestry and Geological Development consisting of J. M. Mallory, Mrs. M. E. Judd and Bonnell Stone, to report on the cost of a Georgia Water Resource Survey, reported at the last meeting of the Commission favoring such a survey. From the report the following excerpts are made:

"We do not consider stream gaging necessary in Georgia for either navigation or for power development, because such uses are confined to larger streams and are gauged by the federal government or have been developed or surveyed. What is needed is the flow or capacity of smaller streams of sufficient volume for municipal or industrial purposes, upon which there is now no data. Besides the flow of these streams we should have the chemical analysis and temperatures of all streams in the state.

"A paper mill requires an enormous supply of water. The same is true of rayon plants, bleacheries, chemical and other lines of manufacturing.

"With a state appropriation of \$5,000 supplemented by federal aid funds, we could install 50 gaging stations. For each \$1,000 another 10 stations could be installed. Naturally this work should be distributed over the state at the most suitable locations."

FAMOUS GROUNDHOG PASSES

The famous groundhog of District Forester H. D. Story, of Albany, has gone where good ground hogs go. It laid aside its "mortal coil" Christmas week. The groundhog was a family pet, a friend of the baby and has the distinction of breaking into the rotogravure sections of Sunday papers. Its last appearance in pictures was as a school master with a stick pointing to a poster telling of the harm of forest fires while the daughter of Mr. and Mrs. Story, an apt pupil, looked on with rapt attention.

BACK TO THE LAND

The Bureau of Agricultural Economics of Washington estimates the increase in farm population of the United States in 1911 at 656,000, and the increase in 1932 at about the same figure, making an estimated total farm population at the beginning of 1933 at 32,000,000. This is very near the peak of the nation's farm population which was 32,077,000 in 1910.

NEW MEMBERS OF COMMISSION APPOINTED

**Two Old Members Reappointed
Two New Appointed to Commission Forestry and Geological Development.**

Alex K. Sessoms, Cogdell and Mrs. M. E. Judd, Dalton, two old members of the Commission of Forestry and Geological Development and two new members, Robert E. Price, Kingsland and L. L. Moore, Moultrie, were appointed to membership in the commission, by Governor Richard B. Russell before his retirement from office.

The personnel of the Commission as



Hon. L. L. Moore, Moultrie, new Member of Commission.

now stands is: Governor Eugene Talmadge, Chairman; J. Leonard Rountree, Summerville; Alex K. Sessoms, Cogdell; Mrs. M. E. Judd, Dalton; J. M. Mallory, Savannah; Robert E. Price, Kingsland; L. L. Moore, Moultrie.

Mr. Robert E. Price, newly appointed, engaged in forestry work, being manager of the Coffin and Wilson forest holdings in southeast Georgia. His training and experience fit him for valuable service on the commission.

Hon. L. L. Moore, of Moultrie, is a prominent attorney, former member of the state senate, and is keenly interested in promoting the forest and mineral resources of the state. As a member of the General Assembly he manifested able and constructive interest in matters of this kind and is expected to render valuable service on the commission.

Fire scars open the way for heart-rot and hardwood trees. Stop the fires, check the rot.

DEER CHASE ENDS IN COMPLICATIONS

Tree Nurseryman Salvages Doe and Holds Spoil Against All Comers With Much Difficulty.

A hunted deer, fleeing from a pack of dogs, apparently thinking the state tree nursery at Albany, a place of refuge, fell exhausted there. Eitel Bauer, nurseryman, fought off the dogs and carried the doe to the shed to give it first aid treatment, but the deer succumbed in spite of his ministrations.

It looked like a god send. Here was a nice lot of venison that had sped to his arms, so to speak, and a nice hide, to spread on the wall to create a reputation for prowess as a hunter. It looked like the breaks had come his way.

The carcass was skinned and butchered, and then some other things began to contribute to the interest of the unusual situation.

A couple of hunters arrived. One claiming to be a game warden, demanded the remains. Lady luck seemed to have turned her face. Visions of cooked venison and displayed hide began to fade, but Bauer is not the kind to yield without a struggle. He thought an attitude of compromise might work and began a conciliatory line of talk, but while he was trying to reach an agreement with one of the men whereby in the division of spoils, Bauer would get the hide and half the meat, behold the other hunter picked up the hide and made away with it, Bauer protesting volubly as both hunters left with the trophy.

Then another interested visitor came, a warden of the game refuge of the Reynold Brothers Lumber Co. This warden said the deer had been jumped on posted land by the hunters and advised Bauer not to give up the deer. But the hide had already been taken in the high handed manner mentioned.

Next a deputy sheriff arrived, sent, he said by the hunter who claimed to be warden. The deputy sheriff claimed the right to take the meat. High hopes were again reduced to despair. But Bauer put off the official declaring he would not act until he found out his rights.

The next move was Bauer to Gordon Reynolds. Mr. Reynolds showed particular interest because his warden had attempted to intercept the hunters and failed. "Hold the meat and get the hide", said Mr. Reynolds, who claimed that the hide had been taken from state property without consent and in spite of protest.

Quickly the edict of Mr. Reynolds had effect. Apologies were offered by the deputy sheriff and the meat remained with Bauer. But the hide was still a fugitive at last reports. But count on Bauer to stick to the trail 'till the hide comes home.

Though the deer came and virtually committed its meat and hide to Bauer's

keeping, Bauer said it was the hardest meat he has ever undertaken to have and to hold.

SOURCE OF TREE SEED EFFECT ON QUALITY

A study of the effect of sources of seed on their quality is reported by George S. Perry and C. A. Coover of the Pennsylvania Forest Research Institute at Mount Alto, Pa., in the January issue of the Journal of Forestry. Shortleaf pine, pitch pine, yellow poplar and white ash are considered.

Trees of any of the species show wide variations in quantity and quality of their seed. Size of fruit was not found to be an index of quality but weight of seed was found in line with germinative energy.

Seed harvested from the upper part of the crown were found better than those further down.

Cones which mature and scatter their seed first have larger seed than those ripening later but the germinating quality of the more slowly ripening cones is better.

Size of cones is of little value as an index of seed quality.

Occasional trees bear a high proportion of empty seeds and others bear well above the average quantity and quality of seed. Of course, the latter trees should be marked as desirable sources of seed, and the poor yielders should be avoided. In the case of ash a bushel of the seed of certain trees produced as much as 8 or 9 bushels of certain other trees. With yellow poplar it was found that a bushel of cones from certain trees would produce more seedlings than four bushels of other trees.

Forest Supervisor Change

Clinto G. Smith who has been forest supervisor of the Cherokee and Nantahala National forests with headquarters at Athens, Tenn., has been transferred to the Choctawhatchee National Forest with headquarters at Pensacola, Florida and Sam R. Broadbent, supervisor of that forest, succeeds Mr. Smith at Athens, Tennessee.

Professor Walters Honored

Prof. T. G. Walters, Moultrie, has won the title of "Master Teacher" among vocational school of Georgia. He has won through efficiency in all lines of work. His achievement in the forestry project has been outstanding.

A new process of extracting acetic acid direct from wood promises to overcome the handicap imposed by synthetic productions. From a cord of hardwood the following products are obtained: 120 pounds of acetic acid, 1330 pounds of charcoal; 4.5 gallons oil; 40 pounds of pitch, 9 gallons methanol.

Forest fires make the floods greater twin evils largely man made.

FORESTRY EXPENDITURES OF FEDERAL GOVERNMENT

The Federal Forest Service functions under the United States Department of Agriculture. The Forest Service proper receives \$14,979,326, much of which goes to the care of the national forests. In addition \$8,650,229 is paid to the states under the Clark-McNary law for fire preventions, etc. In all about \$23,000,000 is used in protecting and promoting forests or .07 per cent, or less than 1 per cent, of the total spent by the Department of Agriculture.

It is only fair to state, however, that 57.98 per cent of the expenditures of the Department of Agriculture is for state aid in road building and 15.68 per cent for crop loans to farmers and that, in fact, only 10.02 per cent of the expenditures are for the ordinary activities of the Department of Agriculture, including forestry.

Should reductions be made in the ordinary activities of the Department of Agriculture including forestry, they would affect little reduction in expenditures of the federal government while hindering the development of the greatest sources of the nation's wealth.

Southern Hardwoods Studied at Laboratory

The United States Forest Products Laboratory at Madison, Wisconsin, is undertaking studies of southern hardwoods, to answer questions of wood-using industries as to whether southern woods differ in properties from those found elsewhere.

Work has already been inaugurated to determine the variation in properties of southern oaks and other hardwoods under the wide growing conditions ranging from flooded back-water areas to bluffs and ridges.

Seasoning methods are also studied with reference to local conditions of growth.

FUTURE FARMERS' ORGAN

"Gaffa" is the name of the new state organ of the Georgia Association of Future Farmers of America, the January issue of which is vol. 1, no. 2. The Future Farmers Organization is associated with the agricultural vocational schools of the state, the same system of schools which is carrying on the vocational forestry project.

M. D. Mobley, assistant state supervisor of agricultural vocational schools at Tifton is adviser. The publication is full of interesting information and promises to be of great assistance in promoting the future farmers association work.

An oak at Alonville, France, was honored on its 1000th anniversary. The diameter of the trunk is 9 feet. A stairway circles the trunk to reach a chapel built on its branches. The chapel is capable of holding 40 children.

FORESTRY QUESTION BOX

Is it obligatory in Georgia to sell timber only by the Doyle rule?

While the Doyle rule is legal in Georgia, the timber owner has the right to contract on any basis he can get the purchaser to agree. For instance, the sales of timber from the National Forests of Georgia are made according to the Scribner rule.

Are the pines used in France for turpentine the same species as those used in southern states?

The pine used by France is not the same as those used for turpentine in the southern states but is known as the Maritime or Cluster pine.

How long does it take for scars made by fire on hardwood trees to heal?

Investigations made in bottom land hardwoods of the Mississippi river by F. H. Kauffert of the Southern Forest Experiment Station revealed the average fire scars unhealed 15 to 20 years even on young trees. Red gum, white oak and red oak, he found, form wood tissue faster than ash, hackberry and hickory. Fifteen year old scars on red gum, red oak and black oak were approximately 50 per cent healed, whereas scars of the same age on ash, hackberry and hickory were 30 per cent as large as they had been originally.

How much national forest land was purchased in Georgia in 1932?

According to the National Forest Commissions report 60,774 acres were purchased in 1932 at an average of \$5.08 per acre. An additional 5,853 acres were approved for purchase. These purchases and approvals were for the Georgia section both of the Cherokee and Nantahala National Forests.

The spread of the Forest Fire Fighters and the Timber Protective Organizations of Georgia mean effective forest fire insurance over increasing areas of the state.

No one is growing trees for profit who allows forest fires to take their annual toll.

The man who burns off his forest is paying more than taxes on his land.

The best forest fire fighter is he who prevents fires.

Thinnings of young pines for paper pulp are a new incentive for keeping out fire to promote rapid growth and an early crop.

Thick annual rings of sapwood are the substantial evidence of wise forest management.

Tree roots can not feed on ashes alone

IN APPRECIATION OF MR. C. B. HARMAN

The retirement of C. B. Harman from the Commission of Forestry and Geological Development removes from this department one who has served, long, faithfully and well. He was a pioneer in Georgia forestry activities, helping to create the sentiment that resulted in the formation of the Georgia Forest Service.

For eight years, or during the entire life of the State Forest Service, he has been a member of the board and commission directing its affairs. No one has been more keenly interested, nor has done more constructive work in directing and in upbuilding forestry in the state.

Mr. Harman is a lumberman who has looked to the future and given much time and thought to growing trees. He is chairman of the executive committee of the Georgia Forestry Association and recently has promoted forestry rallies that have proven highly successful.

Mr. Harman is author of several technical books pertaining to mill work and for several years he was an executive in a southern mill work association. He will continue his interest in forestry, centering his activities in work of the Georgia Forestry Association and will continue to work with his many friends over the state in forestry promotion.



C. B. Harman, retiring member of Commission of Forestry and Geological Development.

Fire breaks hold forest fires in check as dikes hold back the floods.

Plant pines and let the abandoned, eroding fields have a chance to produce something.

THIRD DISTRICT C. N. Elliott, District Forester Augusta

Georgia Forestry Executive Committee Holds Meeting

On January 4th, the Executive Committee of the Georgia Forestry Association held an executive committee meeting and a public meeting in Augusta. The first was held in the afternoon when the committee discussed the business affairs of the association. The public meeting was held in the ballroom of the Richmond Hotel at 8:00 P. M. and was attended by approximately 40 people from Augusta and the surrounding territory. Mr. M. H. H. Duvall, President of the Augusta Chamber of Commerce presided. Among the notable speakers were Mr. T. G. Woolford, of Atlanta; Miss Emily Woodward, Vienna; Mr. C. B. Harman, Atlanta; Mr. J. M. Mallory, Savannah; Mr. James Fowler, Soperton; Dr. Chas. H. Herty, Savannah; Judge Ogden Persons, Forsyth; Mr. B. M. Lufburrow, State Forester, Atlanta; and Mr. Tom Hamilton, of Augusta.

Mr. Woolford, president of the Georgia Forestry Association, outlined the plan and program of work of the association for the coming year. He said that both a timber and water power survey for the State were needed. Mr. Lufburrow spoke of the growth and development of the state forestry department within the last few years, and outlined some of its purposes and aims. Dr. Herty spoke briefly of the development of the paper industry in Georgia. Other members of the committee spoke briefly of the various activities of the association. Many Augustans have expressed their appreciation of the splendid work being done by the Georgia Forestry Association.

Long Leaf Pines Planted By Boy Scouts

Troop 18 of Augusta recently set out 100 long leaf pine trees on their camp property a few miles north of Augusta. These trees were furnished by the forest school at the State College and put out under the supervision of the district forester.

Fire-Breaks at Goshen Plantation

Fifteen foot firebreaks are being constructed along the boundaries of Goshen plantation which is the property of Mr. Joseph McK. Speer, of Pittsburgh. These firebreaks are being constructed by clearing away all trees, bushes and leaves for a width of 15 feet. They will protect the entire 1200 acres that comprise the plantation. He figures the cost of construction of the breaks will be met by the returns from the cordwood, etc., will soon be available, according to Mr. Jack Speer, who is in charge of the work.

Briar Creek T. P. O.

Briar Creek T. P. O. which was recently organized on lands along Briar Creek

and the lower part of Burke and upper Screven counties has in it 25,936 acres. The officers elected for the organization are:—President, S. B. Duncan; Vice-Presidents, B. M. Dixon, and B. F. Barger; Secretary-Treasurer, W. D. Bell. The special patrolman for this area is Mr. T. M. Moore.

Two New F. F. F.'s

Two new Forest Fire Fighters organizations have recently been organized in the northern part of the Augusta District, one in Stephens and one in Hart county. The F. F. F. of Stephens county has 33 members with a total area of 4185 acres. Hart county's F. F. F. is composed of 372 members with 15,659 acres. The officers have not yet been elected for these organizations.

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Newnan Town Forest Makes Annual Planting—Builds Fire Breaks and Purchases Fire Fighting Equipment

The Newnan town forest, under the direction of Mr. H. H. North, Chairman, Newnan Water and Light Commission, recently finished the planting of 10,000 long-leaf pine, 1,000 white pine, and 750 black walnut seedlings. This is in accordance with a management plan prepared in 1930 by the Georgia Forest Service which calls for a five year period of annual plantings to artificially restock over 250 acres of open land. The area of the whole forest is approximately 1,000 acres which is owned by the City of Newnan, Ga.

Mr. North states that a very important result of planting open areas and keeping out forest fires is the improved flow of streams and the maintenance of a greater constant water flow due to the prevention of rapid run off of rain water by a vegetative cover consisting of forests, woods litter, broom sage grass, etc. The Newnan town forest is the water shed for the Newnan municipal water supply.

The recent purchase of fire fighting equipment and the building of a system of fire breaks indicates the importance which the Newnan authorities attach to the prevention and control of forest fires.

Forest Fire Fighters Organizations

Part time forest patrolmen in the fourth district are to be commended for their Forest Fire Fighters organizations. Eight organizations were formed with a net membership of 184 and a total of 44,687 acres added for fire protection. This was in spite of the fact that organization work was just getting started good when December weather and widespread flu epidemics made it very difficult to get any attendance at organization meetings.

SIXTH DISTRICT

Jack Thurmond, District Forester
Savannah

More Members For Emanuel T.P.O.

Several new members have signed up as members in the Emanuel T. P. O. during the last month with 2,500 acres bringing the total up to 18,000 acres. Mr. J. A. Bell and Mrs. Eula Carmichael are the new members, and have already started on their protective work.

Most of the members in the Emanuel T. P. O. have constructed fire breaks of the solid plowed type 12- to 15 feet wide, plowed with two-horse plows equipped with "Terrace Wings" for turning under the wire grass. The solid plowed breaks cost more than plowed and burned breaks for the first year but in the following year are much cheaper to maintain; in fact the first year with the clearing and plowing they will cost from \$3.50 to \$4.50 per mile but the next year can be freshened with a harrow for \$1.00 per mile. This type of break is proving popular in this section.

Treutlen T. P. O. Planting Pines and Cedar

Mr. Jim L. Gillis member of Treutlen T. P. O., started preparing land recently for his slash pine plantings on "worn out" farm lands. He has marked off his rows and plans to set one year old home-grown slash seedlings and wild stock grown by one of his boys in a vocational forestry home project bed. Mr. Gillis plans to put out 75 acres of young slash during January and early February, spaced 6 x 8 feet.

Mr. Gillis has also prepared his land for planting 25 acres to red cedar to be used for supplying him with fence posts. He will use two year old wild stock and plant them on abandoned farm land spacing 10 by 6. The method used in planting is the same that he has used in his pine plantings during the past years.

Mr. James Fowler of Treutlen T. P. O. also plans to plant about 50 acres of abandoned farm land using woods grown one year slash stock and plant them in his usual style.

Liberty T. P. O. Prepared For Fire

The patrolman in charge of protective work on the Liberty T. P. O. has practically finished with fire break construction work and will devote most of his time now in patrol work and fire fighting.

The 115 miles of fire break plowed last April on the Liberty T. P. O. is in excellent shape this year and will be good in case of backfiring against a big fire, as the wire grass was plowed up as it began growth in the spring and consequently the fire break was left clear all during the summer and last fall. As an added precaution against fire two temporary patrolmen will be employed by the T. P. O. during February and two weeks in March to assist in fire fighting as the burning season draws

to a close, which is always the worst time for fire in this county and especially early March. These men will be equipped with saddle horses, fire pumps and axes.

SEVENTH DISTRICT

C. Bernard Beale, Dist. Forester
Waycross

Waresboro F. F. F. Organized

The Waresboro Consolidated School Forest Fire Fighters has been organized with an active membership of 13 vocational pupils representing their parents' lands, a total of 6512 acres. William Inman, Manor, Georgia, is president and Coy Roberts, Fairfax, Ga., will serve as secretary.

The boys are rigging up a four-wheel trailer, equipped with four back pumps, two water drums, axes, hoes, and rakes and plan to use this in responding to fires. Funds for buying the necessary equipment is being earned by the boys. W. B. Bates, vocational teacher, will direct the fire-fighting, using his car to pull the trailer.

Suwannee Forest Constructing Extensive System Fire Breaks

An extensive system of primary fire breaks 100 feet in width, is being constructed on Suwannee Forest operated by the Superior Pine Products Company in southern Clinch and Echols counties. Under the supervision of Forester W. M. Ottmeir, this system of breaks will divide the 200,000-acre tract into 50 major units and enable control of fire under the most hazardous weather conditions. A secondary system of plowed breaks will be established on each major unit, thus eventually dividing the area into minimum blocks of fifty acres.

The process of constructing the primary breaks is as follows:

1. A plowed furrow is made on each edge of the right-of-way.
2. All dead standing timber and down logs are removed from the breaks.
3. The break is burned clear of all tree overgrowth.
4. Stumps will be eventually pulled and burned on the breaks and the breaks will be plowed progressively annually until the entire break is completely plowed.

It is stated by Forester Ottmeir that the company has adopted a rigid policy of absolute fire protection and that no controlled burning will be practiced, outside of small acreage burned for "hog farms" to accommodate local cattlemen. There will be no burning done on the forest by the company save that of burning off the fire breaks and Mr. Ottmeir states that any reports to the contrary are incorrect.

EIGHTH DISTRICT

H. D. Story, Jr., District Forester
Albany

Demonstration Plots

Demonstration plots at the Albany State Tree Nursery have been completed. Mr. Eitel Bauer, nurseryman, has made plantings of slash, longleaf and loblolly pine, using different spacings for each, so that visitors may see how pines are planted and get some idea of the growth of each species at different spacings.



Pine planted in corn January 27, 1931;
photographed June 21, 1932.

Pine Island T. P. O.

The Pine Island Timber Protective Organization has completed its fire break work. With the organization system of break, tenant patrol, and local cooperation, the owners are confident fires will be held to a minimum.

Reynolds Brothers, members of the Pine Island T. P. O., are making a demonstration planting of 20 acres of slash pine on their lands and may, in the future, plant more of their open land.

Home Projects of Students

The Moultrie High School, T. G. Walters, Vocational Teacher, reports a number of student home projects which he has inspected. He finds the students busy in planting slash pine from the school tree nursery, making fire breaks and thinning where the forests need it.

Pine-Corn Plantation

Marion Renfro, Brooks county farmer, who is carrying on a demonstration of growing pines in cultivated corn field is enthusiastic over the results. He says the corn is carrying all the expenses and that trees planted January 27, 1931, had grown to 84 inches in height when measured January 18, 1933. Trees planted in uncultivated field average about 36 inches in height.

Turner Plantation

E. A. Turner, Quitman, is backing his faith in the slash pine by planting all open land on the Turner plantation. He has already planted 27,000 slash pine seedlings and has an order for 50,000 more, and states that he is just beginning.

Fire breaks have been made on the plantation for the protection of the seedlings.

Preston School Project

Preston school has its new school forest in shape with thinning, pruning and planting plots laid out.

Several special demonstration plots have been laid out in the school forest and the data are to be compiled from these plots by vocational students under the direction of the teacher.

Plantings of slash pine with different spacings are being tried out.

FORESTRY STUDENTS STUDY TREE GROWTH

In order to determine what growth a stand of pines will make in a period of ten years, the vocational agricultural students of Commerce High School are keeping accurate records of the diameter growth and height growth of all trees, over four inches in diameter, on their forestry project that is located on the Jefferson highway.

This is the third year these records have been kept and each year the trees have made a surprisingly good growth. To make the project more interesting it is divided into two plots. One plot has been thinned and is called the thinned area. The other plot not thinned is called the unthinned

area. According to the records the thinned area is growing much faster than the unthinned area. This proves that thinning is a valuable method to follow in carrying on forestry work.—Commerce News.

ARP FORESTRY CLUB NEAR COMMERCE, GA.

Ulysses Carlan who attended the vocational forestry camp last year has carried the spirit of the camp back to his neighborhood near Commerce, Ga. He reports the formation of the Arp Forestry Club with 32 members, which meets twice a month.

The purpose of the club, Carlan reports is to learn some of the practical phases of forestry. The club also has its recreational objectives. On February 15 a debate is scheduled to discuss the proper portion of farm land for growing trees.

The citizens are highly pleased with the constructive work Ulysses Carlan is promoting in the forestry club. Not only is the club conserving forestry resources but the young manhood of the rural community.

Black Locust

The black locust is a general utility tree. It quickly produces good timber for posts and other uses; it roots strongly, thereby checking soil erosion; its flowers enable bees to make a good quantity of honey, and it is a legume. The nodules on its roots store nitrogen in the soil, enriching it for future crops. In addition, it is a tree of beauty and is valuable for shade.

HERTY AWARD FOR VOCATIONAL STUDENTS

Students in Smith-Hughes schools having agricultural vocational teachers are students who in the past have won vocational forestry camp scholarships are entitled to compete for the cash prizes offered by Dr. Charles H. Herty.

Dr. Herty gave last year prizes to students doing the best work in forestry at the school doing the best work. This year he has changed the offer to apply to students doing the best work to promote forestry in their home communities. As to what kind of work this shall be, is left to Dr. Herty to the student. In this way he expects to encourage initiative on the part of the student. What might be the best undertaking in one community might not be the best in another. What one student can do best might not be what another can accomplish.

The local agricultural vocational teacher will report on the work done by each contestant in his school. All such reports will then be compared and those best in each school community will be checked against the best in other school communities. In this way the leaders will be determined and a committee of foresters. The award will be announced at the vocational forestry camp about August 15.



Same pine as shown above photographed January 18, 1933 after growing in second crop of corn.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

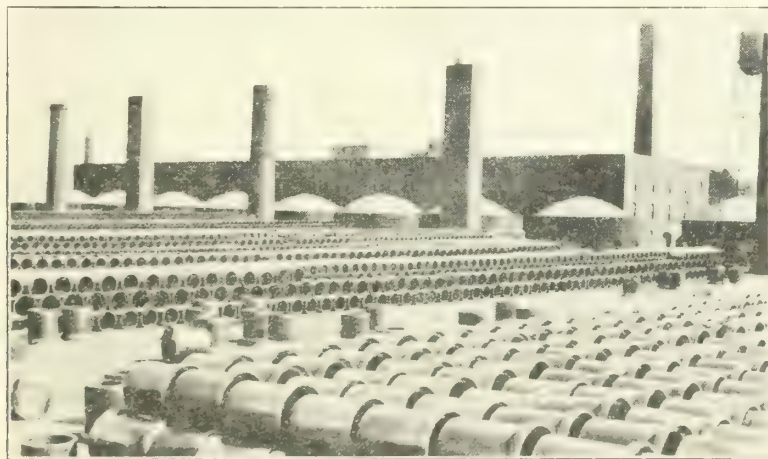
Reported by THE DIVISION OF GEOLOGY

THE SHALE DEPOSITS OF GEORGIA

By RICHARD W. SMITH
Assistant State Geologist

Shale is a consolidated sedimentary clay with well-marked laminations parallel to the bedding. It may be the first step of the process of alteration or metamorphism of a clay into a slate. Fine grinding or weathering of a shale, but not of a slate, will restore more or less of the plasticity and other characteristics of the original clay. Certain red-firing shales are suited for the manufacture of heavy clay products such as building brick, sewer pipes, and structural, roofing and floor tiles.

The shale deposits of Georgia are found in the northwest part of the state in the area of sedimentary rocks of Paleozoic age known as "The Valley," a continuation of the Valley of East Tennessee, the Shenandoah Valley of Virginia, the Cumberland Valley of Pennsylvania, and the Kittatinny Valley of New Jersey.



Sewer pipe plant near Flintstone, northwest Georgia, users of Georgia shale.

The sedimentary rocks in the valley and the adjoining Lookout Plateau consist of shales, limestones, and sandstones, and range in age from early Cambrian to Pennsylvanian. They are composed of material derived from a land area to the southeast and deposited millions of years ago in a shallow sea; the sandstones nearest the shore line or the mouths of the streams, the shales (as clay) further away from the shore, and the limestones in the deepest or clearest water. The various materials were deposited one on top of the other as the shore line oscillated back and forth during the eons of Paleozoic time.

At the close of Pennsylvanian time the

area was elevated above sea level, and the period of the formation of the Appalachian mountains began. The forces that thrust up these mountains, of which we now see a small remnant, exerted tremendous lateral pressure from the southeast against this area of horizontal sedimentary rocks, forcing them into huge folds. As the pressure increased, the folds in the eastern and southeastern part of the area nearest the mountains were compressed, overturned and in places broken. Beds were thrust over each other. The rocks in the adjoining Piedmont plateau and mountain sections were metamorphosed almost beyond recognition, and were thrust over the less metamorphosed beds. All of the beds in the eastern and southeastern part of the valley were left standing on edge and some were partly metamorphosed, sandstones to quartzites and shales to slates. The beds in the northwestern part of the area and the adjoining Lookout Plateau were left in large and fairly gentle folds.

The land gradually elevated in the geologic ages that followed, allowing the

streams to cut down into it and carry off the debris to the ocean. The areas of shale and limestone were softer and more easily worn away, forming the present valleys. The sandstone and chert resisted erosion, forming the present ridges.

The shales of three different formations in Northwest Georgia have been found suitable for the manufacture of heavy clay products in an investigation made by the Division of Geology in 1929-31. Eighty-four samples were collected and tested by the writer at the Ceramul Department of the Georgia School of Technology. Over half of these proved to be of economic value.

The shales of the Conasauga formation of Cambrian age outcrop in the western part of the valley in narrow bands extending from the Alabama line northwest through Chattooga, Walker, and Catoosa counties to the Tennessee line. They also occupy much of the broad valley bottoms of the Coosa, Oostanaula, and Conasauga rivers in the eastern part of the area. The unweathered argillaceous shale is brownish-gray to olive-green in color and is too hard for ceramic uses, but at many places surface weathering has softened the shale to a depth of 25 to 30 feet so that it makes an excellent material, with the proper treatment, for the manufacture of brick and, in a few cases, tile. This is the shale used at Rome in Floyd county and Adairsville in Bartow county for making roofing tile, and at Calhoun in Gordon county for making excellent face brick. Equally beautiful face brick are made from the Conasauga shale at Plainville in Gordon county, at Dalton, Whitfield county, and at Chatsworth, Murray county.

The shale areas of the Rockwood formation of Silurian age outcrop on the low "Shinbone Ridge" that parallels the foot of Pigeon and Lookout mountains and on the western slope of Missionary ridge in Walker county. This shale does not weather as flaky as the Conasauga shale and the weathered material is usually rather slow in slaking to a clay. At present it is not being used for the manufacture of heavy clay products, but laboratory tests on 15 samples indicate that, if correctly handled, it could be used and would produce ware with an excellent red fired color.

The Floyd shale of Mississippian age outcrops principally in the broad plain west of Rome, Georgia. It weathers to a soft flaky black, dark gray, and dark brown material that slakes rapidly to a clay with good plasticity but does not always have a deep red fired color. It appears to be especially suited to the manufacture of difficult shapes, such as sewer pipe, drain tile, and structural tile. It is mined west of Rome and shipped to the plants at Rome, Chattooga, and Macon, and at Milledgeville, where it is used with other shales in the manufacture of the above products. The Floyd shale is also used at the Berry schools at Rome for the manufacture of building brick.

These brick and tile plants are all very similar in operation. The shale is usually mined by steam shovel and carried to the plant in small dump-cars on a narrow-gauge tram line. At the plant the shale is first ground in dry pans. Two large stones like mill-stones travel on edge in a circular pan, crushing the shale which is discharged through a lifted bottom. The ground shale is then screened, the particles that are still too large being returned to the dry pan, and is then mixed with the proper amount of water in a pugmill. This has one or two revolving shafts with knives

blades that cut through the material and thoroughly knead it into a plastic clay. This clay is then forced by an auger through a die, from which it emerges as a continuous ribbon which is automatically cut off into the individual brick or tile.

The brick or tile are stacked on cars and thoroughly dried, usually by artificial heat, and are then stacked in round or rectangular down-draft kilns and the door sealed up with brick. The kiln is then slowly fired by coal or natural gas to a temperature of 1800 to 2000 degrees F., the firing taking from five to eight days. The total time for loading, firing, cooling, and unloading a kiln often takes from fifteen to twenty five days. The brick or tile are then sorted for color and uniformity of size and shipped to the market.

The plants already manufacturing face brick, sewer pipe, and structural and roofing tile from the shales of Northwest Georgia have ample capacity for filling the present demand for these products. The raw materials are there waiting for the expansion of the industry that will surely accompany the industrial expansion of the South following this depression. Detailed information on these raw materials are given in Bulletin 45 of the Geological Division,

DO NOT NEGLECT TO GROW HARDWOODS

By C. B. Harman

While so much is being said and done about reforestation in pine trees little attention is being given to our hardwoods of which we have a number of very valuable species, such as black walnut, yellow poplar, persimmon, dogwood, white oak and red oak.

There exists a great potential wealth in our hardwoods and their culture should be encouraged for use as lumber if for nothing else.

Walnut lumber ranks at the top both in value and popularity. There has always existed a big demand for walnut lumber the world over. For interior finish it has no superior. The demand is, has been for a number of years and the prospect is that it will continue indefinitely, somewhat ahead of the supply which makes it a very attractive proposition from a commercial view.

The same condition exists for yellow poplar lumber as it is suitable for more uses than any other wood.

Persimmon and dogwood are rare, and while restricted to a very few uses their wood has a high value and so far nothing else of any nature has been found or invented to take its place.

White oak and red oak is a fixture the world over as residential flooring and is held in high favor for many other uses which will grow as our original forests decline. It also has a high value but not so high as walnut, persimmon and dogwood.

Our South Georgia section is not so well

adapted to the growing of many of these woods, but from middle Georgia north to the Tennessee and North Carolina lines they all thrive and will produce abundantly if given the opportunity.

Walnut is slow growing; its lumber is hard and dense, so one will have to wait longer for returns, but frequently a single tree will sell for more than all the other trees on an acre of land. In fact, I have known a single walnut tree and its roots to sell for as much as \$1,000 where it stood.

Poplar is a fast growing tree. While not so generally understood, poplar grows to maturity very nearly as quickly as do our southern pines, and its lumber is soft and porous.

Persimmon and dogwood are both very hard and dense and very slow growing, although my experience is that persimmon will grow to a diameter of six inches or eight inches in a very reasonable time.

White oak and red oak are slow growing, hard and dense but produce good size trunks or boles and are very attractive and beautiful trees. They make a fine forest and produce splendid lumber.

It is to these trees which I especially wish to call attention at this time. A few of these trees, a few hundred or a thousand well placed today will produce wonderfully in less time than it takes for a boy or girl to grow to manhood or womanhood and what an inheritance it will be for the son or daughter to possess a forest or even a small number of such trees twenty-five or thirty years from today.

I know of the past and of the present it has been my business and my life to study the use of trees and lumber, and I am sure that I am looking into the future as few other men in Georgia.

Plant your idle land, your vacant patches, fence rows and corners, or even your scrubby woods in walnut, poplar, persimmon, dogwood, white oak and red oak and your sons and daughters will thank and love you for it, and if you are a young man or woman you will remember me.

Write to the Georgia Forest Service, The Capitol, Atlanta, Georgia, and receive without cost as much information as you may desire.

Tree Ring History

Dr. A. E. Douglas of the University of Arizona who has studied 10,000 records of annual ring growth of trees has traced back the growth of giant Sequoias of California for 3,000 years.

By studying timbers in home of Pueblos, and comparing their rings with those of trees, he has been able to obtain records of Indians as far back as 700 A. D. Rings of trees vary with wet and dry years and thus leave their history written in wood rings.

FLORIDA FORESTRY SUPPLEMENT

The Southern Forestry Journal, Jacksonville, issued a "Florida Forestry Supplement" in December in which the problem of forestry are discussed by Franklin D. Roosevelt, Governor Dave Sholtz and a long list of state and national forestry leaders. It is a very important publication that deals intelligently and comprehensively with Florida forests, forest products and land utilization. It will doubtless awaken much interest in Florida.

TEN-YEAR NAVAL STORES EXPERIMENTS

Reviewing Technical Bulletin 298 issued by Lenthal Wyman of Stark, Fla., United States Forestry Experiment Stations, in the Forest Worker, Dr. Austin Cary of the Federal Forestry Service and well known in the South, says, among other things:

"In the first place, Mr. Wyman has found that the yield gains fast with the added size in trees worked. He correlates specific yields with specific sizes. Further, he infers that vast numbers of trees commercially worked are unprofitable. A tree's environment, too, affects its yield: open standing trees, with generous crowns, yield significantly more than trees of the same diameter that are crowded. Individual variation in yield is another thing that has come out. Of two trees of the same size that look alike and stand in similar relations, one may yield two to four times as much as the other. Microscopic study has not determined any structural ground for such individual difference. That fact, of course, takes the work out of the strictly mathematical or mechanical class, calling for a repetition of tests of large numbers of trees and for the use of averages.

"Mr. Wyman has carried out elaborate experiments in chipping the weekly wounding of trees of the tree from which the flow of gum results. These experiments are concerned largely with three details, the best width of face; the best depth of chipping; and the best rate of progress up the tree. The current yield of gum and the maintenance of the yielding power of the tree both considered.

"In relation to existing practice in the region, Mr. Wyman's findings are conservative, but in recent years commercial practice has to some extent been going along with him."

Ocilla and Mystic School Forests Established

Two vocational school forests, one at Ocilla and the other at Mystic, have been recently surveyed, and maps and management plans prepared for same. K. N. Phillips is vocational teacher and plans to start at once on the development of forestry projects.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
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No. 3

NORTHERN PAPER MAKERS VISIT GEORGIA IN MAY

Invitation of Georgia Forestry Association Accepted — Object of Visit is Study of Paper Making at Savannah Research Laboratory

At a meeting of the American Pulp and Paper Manufacturers Association, held in New York City in February, an invitation extended by President T. G. Woolford of the Georgia Forestry Association, to the paper makers to visit Savannah and observe the progress of the paper research plant there, was enthusiastically accepted.

The invitation was read by Dr. Charles H. Herty at the conclusion of his address before the association, which excited much interest, in making news print from southern pines.

The pulp and paper manufacturers will hold their next stated meeting on the boat route to Savannah and on arrival where Oglethorpe landed 200 years ago, the visitors will be guests of the Georgia Forestry Association and the City of Savannah for two days, May 1 and 2.

The Pulp and Paper Makers Association as in its membership leading producers of the United States and Canada. The visit of these paper men is welcomed as the beginning of what is believed will be followed later by their migration to the south for the purpose of seizing the great opportunities for making paper which have been revealed at the Savannah pulp and paper laboratory.

The Georgia Forestry Association had previously decided to hold its annual meeting in the bi-centennial city, Savannah, on April 28 and 29, but representatives of the association will stay over to assist Savannah to entertain the visitors on May 1 and 2.

MOULTRIE HIGH SCHOOL PLANTS PINE SEEDLINGS

Using seedlings grown in its own school nursery, the Moultrie High School has planted 16,000 slash and longleaf seedlings. Most of these were planted on home forest projects of students, the school forest being already planted.

GEORGIA'S 200 YEARS OF GREAT TREE WEALTH

Ability to Grow Trees Unchecked—Timber Area and Possible Timber Products Heads List of States—Bright Future on the Timber Horizon

When Oglethorpe landed at Savannah to found a colony 200 years ago, the area comprising Georgia was an unbroken forest of pines and hardwoods. Houses and forts, the first necessities of the colonies, were erected from trees cut and hewn on the spot. The woods were drawn upon for fuel, fences, vehicles, tools and boats. But with all his needs, the pioneer found trees encumbering the land he decided to cultivate, hence the "log-rollings" and burning of magnificent logs.

When the builders of the famous battleship the Constitution came to lay its keel, Georgia's forests were drawn upon, as were the frames of many others of the ships of the days when American vessels ruled the seas. Since those early days Georgia timber has been shipping on the seas to every civilized country in the world, and with the coming of the railroads the state kept an incessant flow of logs, lumber and timber products to a great part of this country.

It would be difficult to arrive at an approximate value of all the wealth that has come from its trees. It aggregates into the billions of dollars. Even with all these years of depletion, Georgia is normally receiving approximately \$125,000,000 from its forests, forest products and wood manufacture, second only to the value to its agriculture crops.

Georgia stands first among the states in timberland area, with 23,750,000,000 acres, or two-thirds of the land area of the state. Georgia stands first in naval stores production. This is still the empire state and potentially the greatest source of timber and timber products for the future.

But is Georgia measuring up to the opportunities in growing trees? No, far from it. Man made fires have kept down natural reforestation. Millions of acres are sparsely populated with trees. Worn out and abandoned agricultural lands have not been reforested. The consequence is Georgia's forest

(Continued on Page 2, Column 1)

GA. GENERAL ASSEMBLY HEARS DR. HERTY SPEAK

Progress of Work in State Pulp and Paper Research Reported — White News Print from Georgia Pines Revealed — Committees Visit Plant

By invitation of the Senate and House of the General Assembly, Dr. Chas. H. Herty, research chemist in charge of the State Pulp and Paper Laboratory at Savannah, spoke before a joint session of the two bodies at the Capitol February 9th.

President Hamilton McWhorter of the Senate presided. Governor Eugene Talmadge, T. G. Woolford, President of the Georgia Forestry Association, and other distinguished citizens were escorted to the Chamber. Hon. Ed Rivers, Speaker of the House, spoke eloquently of the work of Dr. Herty and its significance to the State and then introduced the speaker of the occasion.

Dr. Herty said he was there to make a report on the progress of work which the State Legislature had committed to him. The progress thus far, he said, had exceeded his expectations. The evidence of accomplishments was displayed before the State's lawmakers in the form of beautiful white news print paper made from five leading species of pine of Georgia, viz., slash, longleaf, loblolly, shortleaf and Virginia pines that are grown in various parts of the state.

Misconceptions about the adaptability of southern pines to making news print paper, he showed, have been removed one by one. Young pines of all species under 25 years of age, he said, had been shown to be as well adapted to making newsprint paper as red spruce commonly used for this purpose. The difficulties that paper men had been led to expect, he showed, did not exist, that there is no difficulty with rosin, that grinding costs of southern pines is less than spruce, that fresh-cut pine can be used successfully. He told of standing trees being cut and converted into paper in 48 hours.

Dr. Herty showed raw materials. An 8 inch section of southern pine ten years old was compared to a section of red spruce 4 inches in diameter 60 years old. The quick growing pines, he said, gave the south all the advantage.

(Continued on Page 2, Column 2)

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(Continued from Page 1, Column 2)

est and potential forest lands are not producing a fourth, or even a fifth as much timber as they could if the best forestry practices were followed.

Georgia's timber growing possibilities are exceptionally great. As many as 163 species of trees with commercial possibilities are native to the state. On its highlands are trees indigenous to the far north. On its coast and Florida border lines are species of the sub-tropics, and between the mountain crests and Florida, trees run nearly the whole gamut of species found in this country. No other state in the Union holds such commercial possibilities.

It is fitting that Georgia, on the 200th anniversary of its founding, should announce to the world that through the vision and ingenuity of a native son, Dr. Charles H. Herty, Georgia pines are suited to making the vast amount of paper required for printing the nation's daily and weekly newspapers. The discovery is epochal. It marks, as is confidently believed, the beginning of a migration of paper mills from the north to the south in the wake of a similar movement of textile mills from the north to the south.

That so great a source of wealth and potential wealth should so long be considered a matter about which Georgia should feel no concern, is astonishing. It was only in 1925 that Georgia established a department of forestry to protect and promote its for-

est resources. In the short time this department has existed and operated on a very small state appropriation, it will be generally admitted that a great awakening to the possibilities of forestry has occurred in this state. Timber owners have responded to appeals of the foresters and organized to follow the plans for timber protection. Land owners have followed the advice of the foresters and are annually planting millions of pine seedlings on abandoned farm lands. State nurseries growing seedlings to sell to land owners at cost, find ready purchasers. Vocational agricultural high schools, following a plan developed by the State Forestry Service, have introduced forestry into their course of study, established school forests and seed beds, and conducted home forestry projects under the supervision of state foresters. These are only high points in the achievements in Georgia's forestry program.

Georgia is rousing to the value of its forest heritage. It is becoming "forestry minded." The 200th anniversary of its founding marks a rising tide of constructive progress that holds promise of a greater realization of forest wealth than has been experienced any time in all the two-century period that has passed.

Owners of large timber areas in Georgia are using the Timber Protective organizations and are cooperating in systematic and intensive protection methods and are using firebreaks, fire towers and fire fighting equipment.

Farmers and owners of small timber tracts are using the Forest Fire Fighters organizations which call for cooperation among farmers in helping each other fight forest fires; in using fire prevention methods such as firebreaks, and in providing fire fighting equipment. A notable example of the organization of farmers into Forest Fire Fighters is in Hart county where more than 75 per cent of the forest area is under this form of fire protection. In this county one can be sure that such precautions are to be taken that in field burning the fires will not be allowed to get into the woods.

(Continued from Page 1, Column 3)

Paper mills, he said, would reluctantly scrap their expensive plants in the north and could not be expected to make an immediate rush for the south, but once they start, there would be a stampede and he felt confident that the south would in a few years become the center of paper manufacture.

The meaning of this to the timberland owners, he said, was a great new source of wealth to farmers of the south.

Dr. Herty expressed his wish to carry on his investigations to the point where every bit of information required by the paper trade, not only for manufacturing white news print, but for information on making book paper and writing paper out of south-

ern woods, and how to use Georgia clays and resins of the pine trees for fillers and sizing.

The Conservation Committee of the Senate and House through the compliments of the Georgia Forestry Association, with T. G. Woolford, president, as host, made a trip to Savannah to inspect the laboratory. This trip proved highly instructive and enjoyable. Savannah, in keeping with its reputation for hospitality, entertained the visitors royally with boat trips, luncheon and dinner.

PROMOTING GEORGIA

In the February edition of the Manufacturers Record, attention is given to Georgia on its 200th anniversary. Three notable contributions are made to this issue. Hon. Eugene Talmadge writes on "Georgia Builds for the Future." Dr. Andrew M. Soule, president of the State College of Agriculture, on "Where Opportunity Beckons," and Hon. P. S. Arkwright, president of the Georgia Power Company, on "Georgia's Part in National Progress."

An excellent editorial also appears in the publication.

EXCELLENT RECORD COUNTY FORESTER SOUTH CAROLINA

Charles Nuite, native of Georgia, graduate of the School of Forestry of Georgia State College of Agriculture, and formerly with the Georgia Forest Service, is one of the few county foresters in this country and is holding a position of this sort in Kershaw county, South Carolina.

Since going to this county about three years ago, Mr. Nuite has made an excellent record. He has 61,000 acres of forest land, 2,000 acres of potential forest land under organized fire protection. In spite of the drouth and high fire hazard of last year, the organized area suffered only 2 per cent fire loss.

Slightly more than half of all the pine seedlings planted in South Carolina were planted in Kershaw county under Mr. Nuite's direction.

TRAIL RIDERS OF THE NATIONAL FOREST

The American Forestry Association announces the organization of the "Trail Riders of America," national in scope, having as its object public exploration primitive areas of America. The trips will be made in cooperation with the United States Forest Service.

The first trip will be made in July in the Flathead National Forest in Montana, and the second in August in the Sun River Wilderness in Montana. Pack and saddle horses alone will be used.

BURNING FIELD LITTER STARTS FOREST FIRES

Spring Preparation for Planting is Time of Greatest Number of Forest Fires in Georgia and Needless Cause of Great Damage

It is common practice in Georgia to burn off rubbish of old fields previous to breaking the land. Agriculturists are in agreement that turning under the rubbish is far better for the soil than burning, especially if the land is broken early, and early breaking is always preferable. But burning off the fields, like burning off woods, is a difficult practice to stop.

It is of course needless to let the field fires spread into the woods. A little precaution is all that is necessary. Most of the fires spread from field to forest where the farmer burns out fence rows. If the litter to be burned is piled, and combustible matter is removed between the piles and the forest, the fires can be held in place.

It is of course foolish to burn the fields on windy days. Fire control is then very difficult and the damage is often enormous. Fencing is often burned. If it is a wire fence some may not be aware that the fire seriously damages the wire so that it will rust and last a comparatively short time. Of course the posts and all wooden parts of a fence are destroyed or seriously damaged.

A good many farmers still believe that burning off the woods decreases the danger from crop insects, especially the cotton boll weevil. It has been repeatedly shown that the boll weevil does not spend the winter among the leaves and litter of the forest floor, but hibernates largely under the bark, in crevices, knot holes and other dry places where the forest fire does not reach.

Farmers who are indifferent to the forest fires do not realize that tree seedlings are killed outright; that fires cause scars on trees that start rot and insect damage; that fires destroy humus and plant food the trees need; that leaves and litter are needed on the forest floor to store rainfall for the seed of trees and for storing water to supply springs and wells; that burned over forests cause greater surface flow of water and erosion that ruins land and chokes the streams; that natural growth is under the trees, especially the best grazing grasses, kept from growing. If farmers generally realize these facts, willful burning of the forests would never be undertaken, and fires started accidentally would be fought.

Sand and gravel washed upon the bottom and did not come from a forest.

Sand makes slow progress in forming soil where the surface vegetable matter is burned annually.

Plant trees and redeem the land sacrificed by slipshod agriculture.

TREE LIFE OF SOUTHERN FLORIDA

Some Observations of a Georgia District Forester On a Visit to the Tip of Florida

By C. N. ELLIOTT

The southern tip of Florida lies just outside the torrid zone. Nevertheless, it abounds with tropical plant and animal life. In the tropical part of North America there is perpetual spring or summer. Nothing I can say will give an adequate description of that land of sunshine with its warm breezes, eternal flowers and birds of brilliant plumage. Among the trees are many unusual forms and unique specimens not found anywhere else in North America.

One of the most interesting trees of southern Florida is the mangrove. This tree grows on a wide bracket of roots which seem to hold it suspended in the air. It has been said that the mangrove helped to

mud and help the crown of the tree to increase in size. Several species of trees having these aerial roots form a banyan swamp and grow so thickly that traveling is almost impossible.

One of the most beautiful tropical trees growing in Florida is the royal palm. Adequate words to describe this tree are not in my vocabulary. Its smooth, slightly bulging, light grayish-white trunk, its clustered tops, its very regality, beggars any attempt at description. Royal palms are generally planted in southern Florida as ornamentals. It might be interesting to know that the scientific name of this tree is *Roystonea regia* and that it was named for General Roy Stone of the United States Army.

Then too, there are the cocoanut palms and I should like to say that there is no sweeter drink in all the world than the milk of a slightly green cocoanut freshly



View of Typical Scene of the Southernmost Tip of Florida.

make the State of Florida by pushing its way out on the mud and coral flats where no other trees dared go. Nature has given it facilities which enable it to spread readily and rapidly. One of these facilities is in the seed which develops and sprouts on the tree. When it becomes mature, a little plume of folded leaves grows out of the seed and it goes through the first stage of development on the tree while hanging suspended in the air. This must be nature's provision so that the seed will not drown in the water at the base of the tree, for when it finally turns loose and falls, it lands with the plume end up. The plume, held in growing position, soon expands and bursts into leaf. The seed develops roots which push into the mud. Thus a tree is born.

Another method by which the mangrove spreads is by aerial roots. Trees having these roots are called "banyans". These roots develop from limbs of the tree and drop downward until they come in contact with the ground. They take root in the

pulled from one of those trees, especially after you have cut and broken and sawed and gouged your way through the protecting husk.

Another tree which especially interested me was the strangling fig. This tree begins life as a vine. It climbs some unoffending tree, gradually wraps itself around the trunk and pushes up and up until its branches are bathed in the sunlight. Then the slow process of strangling begins. The victim does not have a chance. The life giving sun is shut off at the top and the body of the fig spreads itself like a snake and restricts the growth of the tree trunk, sometimes growing completely around it and sealing it in a living tomb. By the time this ungrateful fig has smothered and killed its victim, its own trunk is strong enough to hold it up and it continues to grow as a tree. Once it is established it also sends out aerial roots to aid in the development of its crown. This tree is the black sheep of the same family to which our cultivated figs belong.

Other trees which may be briefly mentioned are:

Fiddlewood, which has about 20 species to be found in tropical America and which is distributed from Florida to California. The name fiddlewood is said to be a corruption of the earlier French-Colonial **Bois Fidele**, an allusion to the strength and toughness of the wood.

Cocoa plum, which grows as a shrub on the Georgia coast and grows into a tree on the southern tip of Florida. The African species of this tree has a tasteless fruit which is eaten by the savages. The astringent bark, leaves and roots are said to be used as a medicine. **Chrysobalanus**, which is the generic name, is said to describe the golden fruit of one of the species.

Marlberry, which is used as an ornamental, is cultivated for its brightly colored fruit and lustrous foliage.

Black ironwood, whose generic name is **Krugiodendron**, was so named in honor of Leopold Krug who did some work among the flora of the Antilles.

GEORGIA'S NAVAL STORES EXPORTS LARGE IN VALUE

Only Georgia's cotton exports exceed its naval stores in value, according to information put out by the Bureau of Commerce of the United States.

For 9 months in 1932, 393,632 barrels of rosin were exported as compared to 365,411 barrels for 1931. The turpentine exported from Georgia for 9 months in 1932 amounted to 4,710,622 gallons as against 5,261,225 gallons in 1931.

The value of cotton exported for the first 9 months of 1932 from Georgia was \$10,511,562 and the value of naval stores was in round numbers \$4,000,000.

PULP WOOD HELPS LOUISIANA FARMERS

Louisiana is fortunate in having seven paper mills that manufacture kraft or wrapping paper. During the depression the mills have continued their purchases of pulpwood from needy farmers. The purchases have aggregated over a million and a half dollars annually right along. Extension Forester Robert Moore quotes a farmer as saying: "If we can sell pulp timber it will beat government help."

When Georgia completes its research work to find how to make white paper from pines, now progressing so promisingly, the farmers' market for pulp timber is expected to become many times what it is now.

It is better that trees than gullies take the land.

Water in the well is deeper where the forest is left unburned.

FORESTRY QUESTION BOX

What is Paper Sizing, and to what extent is rosin used for this purpose?

Rosin from southern pines has been used in making higher grade papers for 125 years. The rosin gives the paper finish and smoothness which ordinary wood pulp paper, such as is used for printing newspapers, lacks.

Previous to the use of rosin, gypsum, starch and animal fats were used, but rosin displaced these materials. Efforts have been made to supplant rosin with other materials, but rosin still holds first place, and other materials only become supplements to rosin.

Claims that rosin caused deterioration of paper have been disproved by the Bureau of Standards of Washington, its recent finds showing a protective effect.

Recent developments in the use of saponified dry rosin point to a more economical and secure status of rosin than even at present.

What are the main industrial uses of rosin?

The largest industrial consumers of rosin are the producers of paper and fibre board, soap and paint varnish and lacquer. Those classed as medium consuming industries are: Rosin oil and printing ink; linoleum and oil cloth; sealing wax and insulation; foundries and core oil; small consuming industries are producers of chemicals and pharmaceuticals, matches and woodenware, autos and wagons, polish and leather, ship yards and car shops. Under miscellaneous industrial uses are classed batik, munitions, belt dressing, brewers' pitch, shoe compounds, de-hairing hogs, rubber compounds, sticky flypaper, plastic compounds, asphalt emulsions, setting brush bristles, talking machine records, flux for soldering and tinning, waterproofing compounds and other minor uses.

Nearly a million barrels of rosin are required annually for its various industrial uses.

Would you plant pine seed instead of seedlings?

Since you cannot get the kind of seedlings you want and are willing to try seed planting, it is advised that you plant at 6 or 8 feet apart, placing 4 or 5 seed to the hill to make more certain that low germination will not result in a poor stand.

The greatest difficulty about planting comes of birds and field mice eating the seed. Some who have planted seed to the field have been quite successful. More often the results are not as good as those obtained from planting seedlings grown in tree nurseries.

FIRST DISTRICT

**W. D. Young, District Forester
Rome**

School Program in Floyd County

Plans have been made and program worked out for visits to schools of Floyd county by the agricultural group of the Rome Chamber of Commerce and the district forester. An exhibit of the manufacture of paper from Georgia pine will be put up at each school to be seen by those attending. The programs will be put on at night and large attendance is anticipated.

A program printed on paper made from loblolly pine of Floyd county, for the Forest Conservation of the Model High School is as follows:

Master of Ceremonies, Miss Janette Pennington.

Address of Welcome, Howard Braden
Response, Leon Covington, Vice Pres.
Chamber of Commerce

Making Paper from Georgia Pines, Walter S. Cothran

Musical numbers, Mrs. W. G. Lea, accompanied by Mrs. Frank Muschamp
Conservation and Protection of Growing Timber, W. D. Young

Emory, the Magician
Goodnight

Ushers—Lois Carden, June Rush, Raymond Salmon, Elmer Blalock, Harlow Williams, Alvin Davis.

Haralson County Campaign

A forestry campaign of schools in Haralson county, conducted by the county agent, C. L. Vaughn, W. D. Young, District Forester, and D. Barrett of the State College of Agriculture, was put on the latter part of January. Fourteen schools were visited and talks were made on the value of forest and fire prevention. Several motion pictures were put on at night with a total attendance of 1450 people.

Good Fire Record

Records of T. P. O.'s in the Rome district show that only 27 fires occurred in 1932 within the protected areas of the six T. P. O.'s now operating, with a total of 127,863 acres. The 27 fires burned over 2,027 acres which is less than 2 per cent. This is effective fire control for the timber protective organizations.

SECOND DISTRICT

**Everett B. Stone, Jr., Dist.
Forester
Gainesville**

Removal of District Headquarters

The district office at Gainesville has been moved from the quarters formerly occupied to the Bailey building opposite the post office. This was made necessary since the building formerly used will be removed.

to make way for the new federal building on which construction is scheduled to begin soon.

Virginia Pine Tested for Newsprint Paper

A cord of pine pulpwood of the species *Pinus Virginiana*, known locally as "black pine", has recently been shipped to the experimental pulp and paper laboratory at Savannah from White county. The wood was donated by interested citizens of White county and transported by them to Savannah where it was turned over to the Southern Railway which transported the wood free of charge to Savannah. There are many cords of this wood ready for the market and the development of the pulp industry in the State will find this section in a favorable position in regard to furnishing the material for such an industry.

Fire Fighters Increase Protected Area

The new fire protection organizations have increased in acreage and the members have been active in fire suppression. A few fires have occurred this year and wherever they have been discovered on lands under protection, or threatening such lands, steps have been taken to suppress them.

THIRD DISTRICT C. N. Elliott, District Forester Augusta

Fire Breaks at Goshen Plantation

In a recent report of expenditures turned in to the District Forester by Dick Speer, who is in charge of the forestry work at Goshen plantation, it was shown that he had completed 1 1-4 mile of firebreaks, 15 feet wide, at a profit. This break was constructed through mixed pines and scrub oak woods for approximately 1 mile. The remainder was through thick creek swamp. This break will protect 500 acres of forest land. The total labor cost was \$32.15. The returns were in form of cordwood, there being 35 cords of wood cut out of the break. Mr. Speer advertises that he pays \$3.00 per cord for such wood but even a minimum of \$1.00 per cord will allow him a profit of \$1.85 on the 1 1-4 mile firebreak.

80,000 Pines Planted

Approximately 80,000 long leaf and slash pine seedlings were planted in Augusta District during the past two months. Some of the larger plantations were on the farms of E. A. Roesel, George Blanchard, A. C. Haskell, W. F. Bowe, Jr., and the Gwinn-Nixon State Forest. These seedlings were secured from the state nursery at Albany and from the Forest School at Athens.

Radio Talks Continued

Much interest has been shown in the bi-weekly radio talks on forestry and kindred subjects over station WRDW in Augusta. Several letters have come into the district forester's office requesting information and data relative to the subjects discussed over the air.

Patrolman's Extraordinary Service

One of the vocational teachers asked the patrolman one night if he would like to go around and watch the loading of produce trucks going to Atlanta. He said that he would enjoy the experience. At the very first house the truck stopped to get turkeys, which were all roosting in a tree. The vocational teacher said, "Here is a forester who ought to be good at climbing trees so we will let him get up there and catch the turkeys."

After skinning his shins and portions of his torso the patrolman reached the part of the tree in which the turkeys were roosting. Seeing an especially large turkey out on the end of a branch he crawled out and caught the bird by one of its drumsticks and was almost jerked out of the tree. After a struggle the subdued bird was carried to the ground.

"Oh!", said the lady who owned the turkeys, "you got Jim. I don't want to sell Jim. Put him back and get John."

And so on. When the patrolman caught Jane she would want Nell, and when he brought Archibald she was sure to ask for Louis. This is no turkey tale either, as a number of people present will attest. The patrolman said he worked until one o'clock catching turkeys and chickens and loading cabbages."

GEORGIA PARKS AND HISTORIC SHRINE MOVEMENT APPROVED

The committee of the General Assembly on Historical Research of which Helen Coxon is chairman, is of record favoring the development of parks and historic shrines.

At a meeting of the committee, E. R. King, Fort Gaines, representative of Clay county, introduced the following resolution, which was unanimously adopted:

"I move that the Committee on Historical Research endorse the program for a system of state parks and historic shrines, as advocated by the Georgia Forestry Association."

Burning weeds and crop residue that should be turned under to improve the soil, is bad practice but is worse when field fires are allowed to invade the forests.

The fact that Georgia laws prescribe when and what precautions are to be taken in burning off land, the practice of burning is not thereby approved, but the effort is to restrict the damage to those who are guilty of the practice.

"Watch my smoke" is not a compliment to the man who burns off his forests.

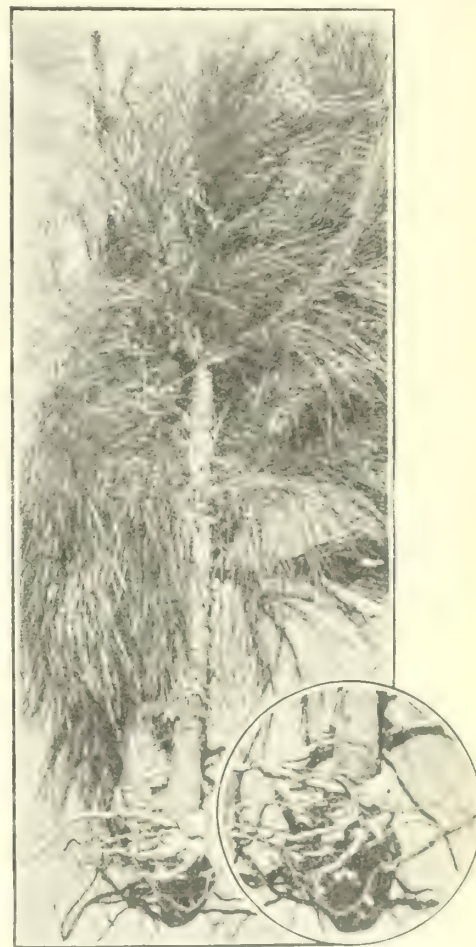
An ounce of fire prevention is often worth ten ounces of fire fighting.

A scar on a tree starts infection that reaches the heart.

FOURTH DISTRICT W. G. Wallace, Dist. Forester Columbus

An Observation Regarding the Planting of Longleaf Pine

The longleaf pine as shown in the accompanying picture was noticed to be dead, but there was no apparent reason for its death until dug up. It was the largest of several thousand longleaf pine seedlings planted in an old field three or four years ago, and from its comparative size would appear to have been the healthiest seedling.



A Pine With Cramped Tap Root Starts Well, Then Dies.

A glance at the root system tells the story. It is obvious that in planting, care is necessary to straighten out the important tap root characteristic of longleaf pine, was not taken. The seedlings then grew well for a few years but died when the tap root failed to develop. I have often observed dying or dead longleaf seedlings one or two years following planting and in a large number of cases observed that death was due to not pointing the end of the tap root downward at the time of planting.

This is merely to call attention to an important point when making future plantings.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Convicted for Woods Burning

A conviction was recently obtained in the Superior Court of Bulloch county in a woods burning and damage suit of Brannen Finance and Realty Corporation against Mr. F. C. Roiser, Turpentine Operator of Stilson, Georgia.

In March 1932 the District Forester made a survey, map, and damage estimate of the area burned and submitted it to the plaintiff who had the defendant indicted by the grand jury at its regular meeting and the case came up for trial at the regular term of court the first time it was in session this year. There were several witnesses who saw the fire spread from the turpentine woods which Mr. Roiser had under lease and burns every year to the land of the Brannen Finance and Realty Corp. which had been protected for several years and supported a good growth of young Slash timber. The young timber was completely destroyed and the old seed trees were severely injured some being burned down and burned up, in fact the tract of timber which had been so promising was rendered worthless by the fire which resulted from the destructive practice of raking and burning turpentine timber by many operators.

The woods burning case attracted lots of attention as it was the first one to ever come to trial in the county. The plaintiff secured the damages he asked for and Mr. Roiser was also held responsible for the criminal side of the case which was burning woods out of season and letting fire spread to adjoining land. This is a very gratifying turn of public sentiment and as the public realizes more fully just what the young timber is really worth more woods burners will be convicted and fires of this nature will be greatly reduced.

Plants Longleaf Pines

Mr. J. T. Avret of Farmdale, Georgia, last week planted 45,000 longleaf pine seedlings on clay hills or old abandoned farm lands which were becoming very badly eroded. Mr. Avret used 1 and 2 year old woods grown stock which is very plentiful on his farm.

He protects all his woods from fire and gives the little pine a chance to grow.

He is spacing them 7 x 7 feet which will give him about 900 per acre. Before he finishes he hopes to plant at least 10 acres this season. Farmdale is in the central part of Screven county and the rolling sand clay is suited to longleaf pines. The planting was done according to the information outlined in the Georgia Forest Service Bulletin No. 16, "Planting Longleaf and Slash Pines."

Litter on a forest floor blunts the teeth of erosion.

EIGHTH DISTRICT

**H. D. Story, Jr., Dist. Forester
Albany**

**Stopped Burning Lowland
Has Stand Slash Pine**

M. A. Chafin, living near Moultrie, has some lowland that he burned over annually, expecting to improve the little grazing it afforded. M. A. Chafin, Jr. studying forestry at the Moultrie High School, got a notion that if fires were kept out this lowland might grow up in slash pines like those nearby.

To accomodate his son, the father agreed to keep the fires out of this boggy area. This marshy land has been kept fire free three years.

What is the result? A splendid stand of young slash pine growing where worthless watergrass grew before; something worth while now growing on the land.

Meanwhile, some other pasture land was burned over annually. The last burning got out of hand and invaded the young stuff that had sprung up as stated above. Then it was decided to protect the burned over area. Again, the result is a good stand of slash pine growing thriftily as if it expected to supply a paper mill with pulp wood in a short time with its thinnings, then naval stores from the trees remaining, and later on, poles or saw timber.

The Chafin demonstration is attracting the attention of neighbors as evidence that if fires are kept out, seed trees and soil will bring on a forest.

**MEETING OF ASSOCIATION
SAVANNAH, APRIL 28-29****Executive Committee Met in Atlanta
February 23 — To Entertain
Pulp and Paper Manufacturers—
Great Meeting Expected**

A program of prominent speakers, inspection of pulp and paper laboratory, exhibits, and entertainment of members of the American Pulp and Paper Manufacturers Association, is being arranged for the annual meeting of the Georgia Forestry Association April 28, 29 and May 1 at Savannah. The meeting is to be one of the features of Savannah's celebration of the 200th anniversary of the founding of Georgia.

The executive committee of the association held a meeting in Atlanta on February 23rd, mapped the general outline of the program, and appointed committees to carry out the plans. In general, the plan is to have the regular meeting of the Georgia Forestry Association on Friday and Saturday, April 28 and 29, and remain over 'till May 1 to help entertain pulp and paper manufacturers of the north who will arrive May 1 to make a two-day visit to

study work of the paper research plant and to take a look at southern pines.

Those in attendance at the executive committee meeting were T. G. Woolford, Atlanta, President; C. B. Harman, Atlanta, Chairman Executive Committee; Bonnell Stone, Oxford, Secretary; B. S. Miller, Atlanta, E. S. Center, Jr., Atlanta, James Fowler, Soperton, J. M. Mallory, Savannah, Thomas Hamilton, Augusta; Joseph McCord, Atlanta; George Butler, Savannah; B. M. Lufburrow, State Forester, Atlanta; Judge Ogden Persons, Forsyth; C. A. Whittle, Atlanta.

C. B. Harman presided. The dates above mentioned for the meeting were adopted. Headquarters for the association will be at the Savannah Hotel and headquarters for the visiting paper men at the DeSoto Hotel.

The program committee appointed to develop the program consists of Bonnell Stone, Chairman; C. B. Harman, George Butler, Dr. Chas. H. Herty and T. G. Woolford.

A local committee on arrangements and entertainment was appointed, consisting of George Butler, J. M. Mallory, Dr. Porter Pierpont, G. B. King, Dr. Chas. H. Herty and Bonnell Stone.

A committee on exhibits consists of J. M. Mallory, George Butler, Dr. Porter Pierpont, G. B. King, Joe Woodruff and Jack Thurmond.

A program devoted to educational work in forestry is to be carried out Friday afternoon, April 28. C. A. Whittle, Atlanta; M. D. Mobley, Tifton, and Jack Thurmond, Savannah, being appointed to have this feature in charge.

At the conclusion of the meeting, the committee was entertained at luncheon by President T. G. Woolford.

CO-WORKERS

The tree and the stream are co-workers,
As water is supplied to our land—
The life they live, and the life they give,
The things they make, and the things they take

Are vital to the welfare of man.

Bonnell Stone, Feb. 22, 1933.

BUSHES GROW IN TREES

In the campaign in Northeastern States to eradicate currant and gooseberry bushes to prevent them harboring white pine blister rust, control agents of the United States Department of Agriculture have found bushes growing in trees as well as in the ground. In Warren county, N. Y., an agent removed eight wild gooseberry bushes from five maple trees.

Osage orange is the only native wood that furnishes a dye in commercial quantities. In color it ranges from yellow to golden brown and is used in dyeing leather as well as textiles.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

REPORT OF GEORGIA'S MINERAL RESOURCES

By S. W. McALLIE, State Geologist

A report of the mineral production of Georgia to the Commission of Forestry and Geological Development the latter part of 1932 by the State Geologist, is summarized in the following table:

VALUE OF THE MINERAL RESOURCES OF GEORGIA FOR 1931

Asbestos, Ocher*	\$ 5,839
Barite, Bauxite	264,001
Cement, Lime (mostly cement)	1,336,457
Clay	1,656,433
Clay Products	1,194,371
Coal, Granite (mostly granite)	2,076,505
Fullers Earth	844,917
Iron Ore	51,513
Limestone	658,544
Manganese	78,824
Marble	3,350,351
Mica, Chlorite, Gold	20,761
Sand and Gravel	204,593
Slate, Talc	169,326
	\$11,912,435
WATER POWER	11,235,312
	\$23,147,747

More detailed report of each of the mineral resources is embodied in the following statement:

Asbestos—Asbestos is a fibrous mineral, somewhat resembling wood in physical appearance. It is non-combustible and is extensively used for insulation purposes. Only one company reported the production of asbestos in the State in 1931: namely, the Mayton Paving Company, located in White county near Cleveland. The total value of the output of asbestos for 1931 was approximately only 38 per cent of that of the previous year.

Barite—Barite is a very heavy mineral, usually of a white color. It is known to occur in the following counties of the State: Bartow, Whitfield and Murray, but only in the first named county has it been extensively worked both during and subsequent to the World War. It is also used in the manufacture of paper, rubber, barium salts, as well as for refining sugar, glazing pottery, and in enameling iron. The total amount of barite put on the market in 1931 was practically the same as that in 1930; the value per ton, however, was slightly greater, the average price per ton being approximately \$5.30.

Bauxite—The ore from which the metal aluminum is made is called bauxite. It is

a hydrated oxide of aluminum. Bauxite was first discovered in America near Rome, Floyd county, Georgia, in 1887. The following counties of Georgia have produced bauxite in commercial quantities: Floyd, Polk, Bartow, Gordon, Chattooga, and Walker, in northwest Georgia; and Wilkinson, Sumter, Macon, Stewart, and Meriwether, in middle and south Georgia. Only two producers reported production of bauxite in 1931, both plants being located in Sumter county, near Andersonville. All of the bauxite produced in 1931 was consumed in the chemical industry.

Cement—The total value of Portland cement produced in 1931 was \$383,906 less than in 1930. The plants reporting production are as follows: Pennsylvania-Dixie Cement Corporation, Clinchfield, Houston county; Southern States Portland Cement Company, Rockmart, Polk county; and Georgia Cement and Products Corporation, Portland, Polk county. The price per barrel of Portland cement in 1931 was 33 cents less than in 1930.

Clay (Kaolin)—Eight counties reported production of clay in 1931 which, named in the order of the value of their output, are as follows: Wilkinson, Twiggs, Glascock, Richmond, Houston, Hancock, Taylor, and Bladwin. Most of these clays were used in the paper industry, although a considerable amount was used in refracting pottery and other industries. The total value of the clay in 1931 was \$1,656,433, which was a decrease of \$304,776, compared to the production in 1930. The value of the clay put on the market was approximately \$6.00 per ton. Georgia still remains the leading state in the production of high grade clays.

Clay Products—The value of clay products in 1931 was \$1,194,371, which is \$279,740 less than that of the previous year.

Coal—Only one company, the Durham Land Company, whose mine is located on Lookout Mountain in Walker county, about 12 miles south of Chattanooga, reported production of coal. The value of the coal produced by this company in 1931 was \$26,757 (55 per cent) greater than that of the previous year.

Fullers Earth—Fullers earth is a variety of clay used mainly in refining mineral and vegetable oils. Four counties reported production in 1931, which, named in the order of production, are as follows: Decatur, Twiggs, Wilkinson and Stewart. The value of production in 1931 was over a million dollars less than that of 1930. The average

price of fullers earth in 1931 was approximately \$11.00 per ton.

Gold—The value of the gold output in 1931 was limited to a few thousand dollars. The main activities, which consisted chiefly of prospecting and development work, were confined to Lumpkin, McDuffie, Cherokee and Hall counties.

Granite—Eight counties reported granite production which, named in the order of the value of production, were as follows: DeKalb, Elbert, Warren, Madison, Henry, Greene, Hancock, Oglethorpe. The three leading uses to which the granites are now being put are for building stones, concrete, and monumental purposes. Granite is also being extensively used for paving blocks, curbing, road material, etc. The total value of granite produced in the State in 1931 was \$2,031,845, which was an increase of \$34,911 over that of the preceding year.

Iron Ore—Only two counties reported production in 1931 of iron ore: namely, Polk and Floyd. The total production of 20,745 tons was valued at \$51,513, a decrease of approximately \$100,000 from that of 1930.

Lime—The only plant reporting production of lime in 1931 was the Ladd Lime and Stone Company, near Cartersville. The entire output was used mainly for building purposes.

Limestone—Six counties reported limestone production in 1931, which, named in the order of the value of their production, are as follows: Houston, Gilmer, Bartow, Pickens, Polk, Crisp. The value of the total output was \$658,544, an increase of \$280,484 over that of 1930. This increase is mainly accounted for by an increase in the use of limestone in road surfacing. In addition to road construction, the stone is also used for tarraza (floor covering), poultry grit, rubber filler, paint, paper mills and agricultural purposes.

Manganese—Four producers, all of Bartow county: namely, J. T. Thomasson, H. C. Simpson, F. D. Smith, and Manganese Corporation of America, reported production of manganese in 1931. The total value of the production was \$411,124 less than that of the previous year.

Marble—Three counties reported marble production in 1931: namely, Pickens, Randolph, and Cherokee. The main output was from Pickens county, and was produced by the Georgia Marble Company. The total value of the marble produced in the State in 1931 was \$3,350,351, which was an increase of \$528,391 over that of the previous year. It is indeed gratifying to know that Georgia's greatest mineral industry, the marble industry, increased in 1931 the value of its output approximately 18 per cent over that of the previous year.

Mica and Chlorite Schist—Both mica and chlorite schist were produced in 1931. The main output of the former was from the following counties: Rabun, Upson, Monroe, and Elbert, while the sale of chlorite

schist was confined to Cherokee county. The value of these two mineral products was approximately 2 per cent less than that for 1930.

Ocher—Only two companies reported production of ocher in 1931; namely, the Riverside Ochre Company and the Cherokee Oche Company. Both of these companies operate in Bartow county, near Cartersville. The value of the output of ochre was less than one-third of that of 1930. Ochre is made up largely of iron oxide and is used in the manufacture of linoleum, oil cloth, coloring for mortars, etc.

Sand and Gravel—Nineteen counties reported production of sand and gravel last year. These counties, given in order of the value of production, are as follows: Crawford, Muscogee, Dougherty, Effingham, Talbot, Bartow, Thomas, Telfair, Chatham, Warren, Echols, Wheeler, Coffee, DeKalb, Taylor, McIntosh, Jasper, Richmond, Emanuel. The total value of the production was \$204,593, a decrease of \$23,803 below that of the previous year.

Slate—Slate was produced in Bartow and Polk counties in 1931. The main output was from Bartow county. It was marketed in the form of granules, and used in the manufacture of composition roofing. The total value of the production in 1931 was approximately 43 per cent less than that of the preceding year.

Talc—Only two companies reported talc production in 1931; namely, the Cohutta Talc Company and the Georgia Talc Company. The mines and plants of both of these companies are in Murray county, near Chatsworth. The value of the output of these companies was less by approximately 26 per cent than that of the previous year.

Water Power—The total water power of Georgia for public use in 1931, as reported by the United States Geological Survey, was 680,928,000 kilowatt-hours, which was 179,809,000 less than in 1930. Rating the value of water power energy at an average of 1.65 cents per kilowatt-hour generated, the gross value of the output of Georgia water power development for 1931 was \$11,235,312.

If the market timber is poor today, the trees keep growing just the same and the deferred harvest is greater.

The name holly arose from the use of branches and berries to decorate churches at Christmas, when it was called "holy" tree.

Banana oil is not made from bananas or any other fruit. It is one of the hundreds of products obtained from coal tar.

Whether a tree is dead or alive at the time it is cut down makes in itself absolutely no difference, insofar as its strength is concerned, providing the wood is sound.

Service Letter (Pa.).

U. S. FOREST ACREAGE GROWS WITH REFORESTATION

The area of forest land in the United States has increased about 33,000,000 acres, or more than 6 per cent, since 1920, United States Forest Service estimates indicate. Reversion of cultivated and pasture lands to forest is largely responsible for the increase.

A recent study of existing information on forest areas places the commercial-forest area at 496,000,000 acres. Of this total, however, only about three-eighths bears trees of cordwood size, and the remaining three-eighths varies from fully stocked areas of young growth to land practically bare.

Sixty million acres of forest land have been so denuded by lumbering and fire that they are not restocking and will not again become productive without artificial assistance over a long period of years. Abandoned farms, reverted pastures, and cut-over forest lands on which owners have been unwilling or unable to pay taxes are accumulating much faster than the facilities for planting them to good tree stands. Most of this land has commercial timber potentialities, if good forest management and artificial planting can be supplied.

The estimate of commercial forest area does not include about 10,000,000 acres withdrawn from timber cutting for recreational and other public uses, nor does it include about 100,000,000 acres of low-grade woodland and scrub of little or no value for production of saw timber, although much of it is valuable for watershed production.

SOIL-BINDING PLANTS HELP RECLAIM GULLIES

Planting natural soil binders, such as trees, shrubs, vines or grasses, to check gullies that are destroying or threatening to destroy eroded and abandoned farm land in the uplands of the South is advised by the Forest Service, U. S. Department of Agriculture.

Recent studies by the Southern Forest Experiment Station at New Orleans show that it is often cheaper to plant than it is to construct dykes and dams, and that many of the trees and other plants not only bind the soil, but, also, add to its fertility. Some of the trees, like black locust and shortleaf pines, yield a crop of posts or poles in ten or twenty years.

To be most successful in erosion control, it is often advisable to use brush dams, and to plant grass or shrubs along with trees. Black locust and Japanese honeysuckle work very effectively together in the South. Other plants like grasses, lespedeza, and kudzu are also being used. Where all the topsoil and sub-soil are removed in large washes, and only the clay, sand, or gravel remains, trees are more likely to

IDLE LAND PROBLEM

(Editorial Atlanta Journal)

Beyond this simple duty of conservation lies a realm of urgent economic needs which forestry can do much to answer. There are waste land and idle lands, abandoned farms and barren hillsides, amounting, all told, to a large part of the country's area. They are now practically useless to their owners. They produce nothing of value. They contribute little or nothing in the way of taxes to the support of the government. But if put to growing trees, they would become within a few decades a source of goodly income to their owners and of considerable revenue to the public treasury. Further, there are millions of acres of so-called marginal lands, where men now strive to wrest a precarious living from the infertile soil. Unsited to field crops and unnecessary therefor, these spaces could be well used for the production of timber.

It is just here that forestry links the problem of unemployment to the problem of idle land and the problem of diminished farm earnings, and offers timely aid toward solving all three. For if the federal and state governments should launch at this juncture, an adequate program of forest conservation and development, not only would work be provided for multitudes of men, but also the examples thus set and the impetus given to the better use of our forestry resources would be a power for economic progress and prosperity for generations to come. To this end the report of the American Tree Association should prove highly valuable. Embracing all the states, it shows that Georgia has an idle or unproductive forest area of five and a half million acres; that her annual average timber cut is around one billion, three hundred and eighty-six million board feet; and that in the last year for which complete records are available some six million acres of woodland were "burned over."

These figures challenge us to renewed thought and effort on our commonwealth's needs and opportunities in forestry, and to a more earnest weighing of the significant words of President-elect Roosevelt: "It is common sense, and not fantasy, to invest money in tree crops, just as much as to grow annual agricultural crops."

Machinery has not increased the production of wood. The energy of the growing forests is beyond technocratic regulation.

A burned-over, leachy soil makes many roots thirsty and hungry.

thrive than grasses or vines. But usually there are patches of soil that will grow the smaller plants and start them spreading. Where there is moisture enough, cutting of cottonwood or willow may be stuck into the ground to take root and grow.



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GEORGIA FORESTRY ASS'N MEETING AT SAVANNAH

Bicentennial City Host to Both the Georgia Forestry Association and American Pulp and Paper Association—Promises to be History Making Meeting

On April 28, 29 and May 1, the Georgia Forestry Association will hold its twelfth annual meeting at Savannah, during a period when Savannah is celebrating the bicentennial of its founding and the 200th anniversary of the State of Georgia.

On May 1, the association and the city of Savannah will be hosts to the American Pulp and Paper Association, members of which are coming to Georgia to study the work of the State Pulp and Paper Laboratory in making newsprint paper from southern pines and to make field trips to see some of the vast forest resources available as a source of paper pulp.

The headquarters of the Georgia Forestry Association will be at the Savannah Hotel, where the meeting will be held and exhibits displayed. The visiting paper makers will make their headquarters at the DeSoto Hotel, where the joint meeting of the forestry association and the pulp and paper manufacturers will be held on May 1.

The pulp and paper manufacturers will arrive by boat on May 1, and will remain until the night of May 2.

A program of interesting addresses and entertainment will begin at 10 o'clock April 28 at the Savannah Hotel with President I. G. Woolford, Atlanta, in charge. The morning will be devoted to addresses by notable speakers.

The afternoon of April 28 will be devoted to educational work in forestry in Georgia with a large delegation of teachers and educational students interested in forestry, followed by an inspection of the pulp and paper laboratory.

The second day will be given to addresses, followed by a business session. The afternoon will be devoted to sight seeing, and at night a banquet will be held.

Exhibits will be displayed at the Savannah Hotel throughout the meeting.

Monday, May 1, will be "Paper Research Day" in charge of Dr. Charles H. Herty,

with members of the American Pulp and Paper Association as guests.

Tuesday, May 2, will be given to technical phases of paper making from southern pine and will be confined to the paper makers. A trip will be made in the afternoon to neighboring pine forests. The public is invited to attend the meetings of the Georgia Forestry Association and the joint meeting of the forestry association and the pulp and paper manufacturers on Monday, May 1.

Officials of the Georgia Forestry Association are expecting to have the most largely attended session in the history of the association and it is believed it will be history making in its relation to developing the paper making possibilities of the south.

At the time this publication goes to press the details of the program have not been completed.

NO TIMBER SHORTAGE IN UNITED STATES

Present Problem One of Management Including Fire Protection, Says Timber Conservation Board

The special advisory committee of the Timber Conservation Board in Washington made its report. According to this report, the forest areas of the United States, if given ample protection and management, will be more than sufficient to meet any probable future demand in this country for timber products.

The report states the following conclusion:

"The present forest problem in the United States is not one of timber shortage but of the proper protection and management of our forested areas, including adjustment of production of forest products between and within the forest regions to secure best results from existing forest growing stock. The area now covered with commercial forests and likely to remain available for that purpose, if given ample protection and management, is more than sufficient to meet any probable future demand.

"These conditions can be brought about only through positive public and private measures separately and in co-operation."

SEVEN YEAR OLD PINES MAKE EXCELLENT PAPER

Probably First Time Paper was ever Made from Trees of that Age — Trees Planted by James A. Fowler of Soperton made into Newsprint Pulp and Paper Laboratory at Savannah

Paper made from trees planted only seven years is believed to be a world record. This was accomplished in March at the pulp and paper laboratory of the Department of Forestry and Geological Development of Georgia. The trees were grown by James A. Fowler, of Soperton in Emanuel county. Seven years ago Mr. Fowler took up some wild seedlings of slash pine from the forest and planted them in an old field. They grew rapidly without any further attention than to protect them from fire.

The plantings of Mr. Fowler were among the first in the state. The growth rate of the pines has been watched with much interest. The rapidity with which they grew has been a source of astonishment to foresters. Records were made of a tree that grew four inches in diameter in four years. A tree on the Fowler plantation that had grown 8 inches in diameter in six years from planting was exhibited at the annual meeting of the Georgia Forestry Association at Rome, Ga., in 1932 and proved a revelation of the great possibilities of growing pines in plantations.

Desiring to test young trees of such rapid growth for making paper, Dr. Charles H. Herty, research chemist in charge of the pulp and paper laboratory at Savannah, prevailed upon Mr. Fowler to let him have a few trees for the purpose. The young slash pines were treated in the manner used in making newsprint from red spruce, and the result was a fine grade of white paper. This paper was donated to the weekly newspaper at Soperton and was used in a special edition issued at the time a press meeting was held at that place. The paper, of course, gave perfect satisfaction on the press and was the object of much favorable comment on the part of the newspaper men.

The great significance of this achievement is that desirable trees for paper can be grown in seven years and these young

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trees can be converted into high quality paper by the method usually employed in making paper of this grade.

When one considers that it takes red spruce 50 or more years to attain growth which slash pines have made in seven years, the significance of the south as a source of wood pulp is apparent.

Concerning the quality of paper made from the young slash pines, Dr. Herty is quoted as saying before a chemical society at Niagara Falls: "Perhaps the most essential fact about the product is its strength and light weight. It has a burst strength of 10 to 12 pounds a square inch compared with only six or ten pounds for the standard newsprint. It is a 30 pound paper, while the standard is 32.

"This means that newspapers, if able to buy it, would receive 6 2-3 per cent more sheets per ton and their mailing costs by weight would be 6 2-3 cents less."

Richmond County Farmers Hear Forestry Discussed

The Richmond County Farmers Club, formed in 1836, and which has functioned continuously since that time, made forestry the subject of discussion on March 16. The speakers were C. A. Whittle, Educational Manager and C. N. Elliott, District Forester of the Department of Forestry and Geological Development.

FOREST FIRE RECORD FOR YEAR 1932

Drouth in Winter and Spring Created Unusual Fire Hazard—Number and Extent of Fires Large

The years of 1931 and 1932 were unusual in that there was a long, severe drouth. This drouth made the forests very dry and inflammable. As a result, forest fires were difficult to control and they raged over more area than forest fires usually do.

The hardwood swamps of south Georgia dried up and the peat soil burned in many instances, felling trees by burning the soil that gave the tree roots their support.

It is therefore not surprising that during extreme drouths extreme fire damage occurs to forests. The percentage of forest land burned over in 1932 was the greatest since 1925 when the State Forest Service was formed. It may also be said that 1932 had a greater fire hazard than any other year since the State Forest Service was inaugurated.

The organized timber owners of Georgia who operate under the Timber Protective Organizations to control forest fires were subjected to an extreme test. Their success is regarded as proof that the plan is effective. Of the acreage under protection, 12 per cent was burned over. This, of course, is much larger than usual, but measured by the fire hazard it is considered a good showing. Especially is its effectiveness demonstrated when it is observed that over 30 per cent of the unorganized forest area of the State was burned over.

A statistical statement of the forest fire record for 1932 is as follows:

Organized protection	1,405,347 acres
Organized acres burned	170,086 acres
—12.1%	
Number of fires	451
Causes:	
Lightning	1
Railroads	26
Campers	13
Smokers	22
Debris burning	41
Incendiary	182
Lumbering	5
Miscellaneous	62
Unknown	93

Total	451
Damage to merchantable timber	\$103,537
Damage to reproduction	187,223
Total Damage	\$290,760

On unorganized, or unprotected land:

Total area in State	21,263,400 acres
Acres burned	6,621,100—30.4%
Damage	\$7,012,200.
Number of fires	23,560.

FIVE MILLION ACRES PIEDMONT FARMS DESTROYED

Only Forests can Recover Eroded Slopes for Future Use—Soils Authority Tells of Tragedy

Speaking before National Drainage and Flood Control Congress at Columbus, O., H. H. Bennett, of the Bureau of Chemistry and Soils of the United States Department of Agriculture, said:

"Tens of thousands of farmers in the United States are trying to make a living on land made poor by erosion—much of it good, or fairly good, forest land, and it should be used for that purpose.

"Of 50,000,000 acres of the piedmont country east of the Appalachians, stretching from New York to central Alabama, the erosion surveys made by the United States Department of Agriculture show that at least 5,000,000 acres of formerly tilled lands have been permanently destroyed, as far as agricultural use is concerned, and that more than 13,000,000 acres have been completely stripped of surface soil, by washing into the streams, onto the lowlands or out to sea. Many farmers continue to cultivate patches of stripped lands where the soil is so poor that a man might spend a lifetime on it without bettering himself or his farm. Even when prices are good, these farmers are not able to make more than the barest living; in 1925 many families farming in this area had incomes of only \$300 a year.

METALLIZED WOOD

In Germany a process of metallizing wood has recently been developed by which wood is impregnated with certain low melting alloys similar to the creosoting method of wood preservation. It is said that any degree of penetration can be obtained and the resulting product is a combination of wood and metal with the desirable properties of both.

One of the uses suggested for the metallized wood is in the manufacture of self-lubricating bearings. The bearing metal is impregnated into wooden forms, the wood serving as a lubricant. — Service Letter (Pa.).

RED GUM FOSSILS

Dr. Rowland W. Brown of the United States Geological Survey reports fossilized red gum leaves found in shale of Wyoming formed in cretaceous times. A peculiarity of the leaves is that they have three points instead of the five of the present day gum

It is explained that the leaves were laid down on silt soil long ages ago when dinosaurs roamed the forests, and as the layer of silt hardened the leaves became fossilized parts of the stone.

FORESTRY QUESTION BOX

How soon after a forest fire is it safe to estimate the damage?

Pines in the South that have been defoliated and seem to be dead, sometimes revive. This is true especially of longleaf pine. Quite often pines damaged by fire retain green foliage, but die later on. Destructive insects attack weakened trees and sometimes cause their death. Insect damage following fire, must, sometimes, be taken into consideration for fires may be directly responsible.

One would be safer in estimating damage of fire to pines by waiting for three to six months after the fire. In estimating fire damage to hardwoods, the fire scar lets in decay organisms that will continue their destructive influence for the remainder of the tree's life. Such damage, of course, can only be roughly estimated when the extent of the tree's fire scars have been determined.

Why does the State Forest Service recommend growing black locust?

The black locust is especially useful for growing very desirable fence post material. Black locust grows very rapidly and is one of the most durable of all woods in contact with the soil. While black locust grows in greatest abundance in the mountains of Georgia, it makes good growth in all parts of the State. It is one of the legumes of the tree family and is capable of enriching the soil in nitrogen.

Would the fire hazard not be decreased by an occasional burning off of the forests?

A mistaken notion exists that each year a forest is not burned over, the amount of combustible matter accumulates so that the fire hazard is greatly increased. If one will take the pains to observe, he will find in regions like Georgia where there is abundant rain, that litter on the forest floor is so well decayed in a year and so soggy with moisture as to offer very little opportunity for fire. Even small pines thinned and left on the ground are usually so well advanced in decay and so soggy in a year's time as to create very little fire menace.

The most combustible material on the forest floor is the last season's grass growth. For about 4 to 5 months in each year it burns readily, after that the fire hazard of Georgia forests is quite low. Therefore, occasional burning is no real protection but is quite harmful to the forest and its soil, as fire always is.

The only hell that trees are ever called upon to suffer is man made.

UNFAVORABLE REACTION OF DROUTH ON PUBLIC

Let Down of Fire Fighting Morale in Southeast Georgia Unfavorable to Future Profits in Tree Growing — Practice of Forest Burning Renewed

By C. Bernard Beale, District Forester,
Waycross

The drouth of 1931-32 is gone and by many, unfortunately, forgotten. Gone also in many instances is the determination to control fires, so evident during the drouth. Among many landowners in this district fire protection sentiment has waned and many have gone back to burning their lands, but some are still fighting fire and keeping it off their lands entirely.

Up until March 15, only a negligible area of land had been burned by cattlemen. The greater part of the acreage burned has been burned by turpentine operators. Wherever "virgin" cups have been hung, in most instances the land has been burned off prior to hanging cups. It should be noted, however, that turpentine burning, as a whole, has been well controlled this year and confined only to land where there is timber, open land being left rough. Some of this was purposely left rough and other areas escaped burning only through accident. It so happened that the ground has been so wet that the fire often went out of itself, leaving such wet places unburned.

"LIGHT" BURNING DAMAGE

The greatest destruction from fire so far has been observed to sapling young growth. Dense sapling stands, even a thousand or more per acre, have been virtually ruined in many places. Although many have proclaimed the wisdom and good sense of "back-burning", contending that same "can" be done without "scorching a needle" it is doubtful if out of the thousands of acres "back-burned" this year, more than a few hundred acres can be found with minimum damage. On one such burning noted, the fire had burned off needles up two-thirds of the height of the crown. On another burning, the fire had burned the buds in 90 per cent of all slash pines on the area.

Water has been an important controlling factor in limiting the spread of fire in this district (southeast Georgia). Only where there are unraked cups is there much evidence of fire fighting. The general impression seems to be that due to the abundance of water in the streams, ponds and flat lands, the fire cannot do much damage if it is allowed to burn over the hill land and that it is all right to thus let fire creep along. Such people do not seem to realize that a fire not burning fiercely is surely destroying every small seedling in its path.

UNFAVORABLE DROUTH REACTION

The reaction of the drouth is that many people now think it will never be wise, or even possible, to keep land permanently rough. But perhaps the disastrous burning of many thousands of acres of young slash and longleaf pine this season will convince land owners that it is certainly impossible to burn over land having such young growth, to reduce the fire hazard—even in a wet season as at present—without greatly stunting and deforming the young timber growth.

Then, too, if people lost all restraint and let fire run as freely and promiscuously as ever in wet years, when another drouth occurs, fire will again get out of hand and wreak great destruction amongst merchantable sized timber and annihilate the timber of ponds, as happened in so many places in 1931-32. Because water naturally keeps fire down one year does not insure that water will be present to do it the next year. Rainfall is subject to great seasonal fluctuations, and if forest land is to be satisfactorily stocked with timber and a good growth rate kept up, it is necessary to have an organization set up to stop fires at all times. Of greatest value in forest protection, and for making it possible to grow timber profitably is a sentiment of the people against all land fire. When this sentiment fails or collapses, so also does the possibility of growing timber as a sound business proposition collapse.

Possibly in a number of years those people who have given up fire protection will regain confidence in and recognize protecting lands against all fire as being the only successful manner in which to grow timber. Surely, until then, it cannot rightfully be said that the drouth of 1931-32 did its greatest damage then. The destructiveness of that drouth is evident today in the reaction of people to the use of fire and it is indeed possible that this adverse influence of the drouth will be prolonged over a period of years. The ultimate damage may be even greater than the merchantable and sub-merchantable timber actually burned at the time of the drouth.

Lignin, the principal chemical constituent of wood, is still a product in regard to which we know practically nothing. On the American Continent two million tons of lignin are produced annually. In this field alone wood chemists would no doubt find a vast field for research.

Breaking piney woods rooters from feeding on pine roots may require the radical measure of feeding the brutes. They may not understand what feed is at first, but they will learn.

Letting fire kill tree seedlings is one way to make children suffer for the sins of their fathers.

VALUE OF TREES TO MANKIND

By HERMAN A. BRADDY, Pavo, Ga.

(This article won an essay prize given by Holland Magazine. Herman Braddy was a student at the Georgia Vocational Forestry camp last summer.—Editor)

Nothing in all the plant world is so rooted in the affection and the veneration of mankind as the tree. William Cullen Bryant has said "The groves were God's first temples". In Genesis 29 God said, "Behold I have given you . . . every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat".

Here is a verse of that famous poem by Henry Van Dyke called

"SALUTE TO THE TREES"

Many a tree is found in the woods
And every tree for its use is good.
Some for the strength of the gnarled root,
Some for the sweetness of the flower and fruit;

Some for shelter against the storm,
And some to keep the hearthstone warm,
Some for the roof and some for the beam,
And some for a boat to breast the storm;
In the wealth of the wood since the world began,

The trees have offered their gifts to man.

Trees prevent floods and freshets in two ways, (1) by retarding the melting of the snow, and (2) by forming a soil which is called humus. Trees perform indispensable services to the land itself as soil-makers and soil binders.

Trees stand as guardians of health to mankind. Our trees take in carbon-dioxide and give off oxygen. They also serve to equalize the temperature. In wooded regions the temperature is more equable and the atmosphere moister than in treeless regions, other conditions being the same.

Railroads need the trees for fuel and for cross-ties. The shipping industry requires lumber for docks and ships, and requires fuel to run the ships. Automobiles consume gas, generated from coal that trees help to make. In aviation we have uses for our trees. Thus we see that in each of our greater modes of transportation our trees have been utilized.

The farmer needs trees for posts, poles, fuel and lumber for all types of buildings. The coal mines use props made from pines. The paper manufacturers use pines. The shoe industries depend upon the bark of different oaks (Chestnut oak preferred) for the tanning of leather.

Of vast importance are the planing mill products, such as doors, sashes, etc. Boxes, crates, baskets, shingles and furniture are essential items for everyday use.

The naval stores industry depends upon the trees. Turpentine, obtained from the pine trees, is used for medicinal purposes, also for combining with paint, varnish and chemicals. Resin is utilized for the caulking of cracks and for the manufacture of paper, wax, soap, thread and varnish.

From one part or another of various trees civilized people obtain the most important of the fruits; nearly all nuts; spices, oils, quinine, camphor, cork, rubber and dyes.

Moreover, the living branches of trees afford shade and shelter for both man and beast. Their beauty is a never-ending delight. John Keats wrote "A thing of beauty is a joy forever". A tree in all its glowing grandeur and majesty should be preserved, and looked upon with a kind of reverence and awe.

Our trees should be protected from FIRE, FUNGAL DISEASES, and INSECT ENEMIES. Everyone should know that OUR FORESTS are being used four and one-half times faster than they are being reproduced.

Our eminent Theodore Roosevelt said: "A country without children would face a hopeless future; a country without trees is almost as hopeless. When you help to preserve our forests or plant new ones, you are acting the part of a good citizen."

Paraphrasing Joyce Kilmer, "Essays are made by fools like me; But only God can make a tree".

ROOSEVELT'S TENNESSEE WATERSHED PROJECT

Much has been said in the public press about President Roosevelt's gigantic plan for reforestation, reclamation, water power development and farm rehabilitation on the Tennessee river water shed.

Briefly summarized this project includes:

1. Reforestation.
2. Creation of flood control basins in the upper valley, first at Cove Creek in the Clinch River.
3. Waterpower development to be available for cities, states and farm homes.
4. Reclamation of the fertile bottomland for agricultural use.
5. Elimination of the unprofitable marginal lands from farm pursuits.
6. Eventual flood control of the great Mississippi River.
7. Eventual improvement of navigation.

Reforestation work can be started immediately, the President believes, providing work for from 50,000 to 70,000 men.

The whole project would give work to 200,000 men.

Eight states are involved—Tennessee, Virginia, West Virginia, North Carolina, Georgia, and parts of Kentucky, Alabama and Mississippi.

The glow and warmth of camp fires should be smothered, squelched, drowned, or otherwise eradicated by the decampers. Embers are enemies of the forest.

The loblolly pine is much better than its name and the scrub pine is by no means a scrub.

SOUTHEASTERN COUNCIL'S FORESTRY PROGRAM

Announcement of the adoption by the Southeastern Council of a forestry program designed to meet the needs of the eight Southeastern states has been made by the council's forestry committee. The program follows:

1. Encouragement of the teaching of forestry in public schools and colleges, and the development of an appropriation on the part of the general public of the benefits of forest conservation.

2. Speedy extension of each state's forest fire prevention and control system to include all forest land in need of such systematic protection.

3. Promotion of comprehensive economic surveys to provide for land-use zoning to designate areas best suited to agricultural development, private forestry and public forests.

4. Development of a co-ordinated system of publicly owned forests, national, state and local, to be used for lumber production, demonstration of improved timber growing and fire control methods, wild life conservation, public hunting grounds and recreation.

5. Equalization of taxes so that forest property will not carry a greater burden, in proportion to its value, than do other classes of property.

6. State-wide assistance to landowners and the handling of their forestry problems.

7. Encouragement of reforestation of idle and eroding lands by maintaining state forest tree nurseries to provide suitable planting stock.

8. Extension of investigations by federal forest experiment stations and suitable state research agencies upon the various subjects fundamental to economic handling of forest lands.

9. Speedy extension of the entire South east of a survey inaugurated under the McNary-McSweeney Act to supply information now woefully lacking as to the present quality and condition of standing timber, its rate of growth and rate of depletion, and market demands for the several types of timber.

10. Recognition by the federal government of landowners engaged in the practice of forestry as eligible for the same loans, assistance, grants, and privileges as are accorded to the producers of other crops that spring from the soil.

"Forestry is more than trees. It encompasses soil, water, climatic, biological and other influences." — R. Y. Stuart, Chief Forester of the United States.

"The forest is a public utility. It yields values both to the owner and to the public."—Walter Mulford.

STATUS OF VOCATIONAL SCHOOLS MODIFIED

The Division of Forestry works with the Vocational Agricultural Schools of Georgia in a cooperative forestry project. The State Legislature, at its recent session, placed the vocational agricultural work on a new financial basis. Instead of a direct appropriation to vocation education, the support of this work will come hereafter through the general educational appropriation for the public schools administered by the State Board of Education.

It is thought that this arrangement will make it possible to more generally distribute vocational educational teaching over the state than has been possible in the past and permit more counties to avail themselves of the type of instruction that could not be accommodated in the past.

Greater possibilities for extending the forestry work in high schools of the state are considered opened by this new management.

INTERESTING FOREST FACTS

Swedish sawmills are more efficient than those in the United States. The amount of waste, including sawdust, edgings, slabs, bark, and shrinkage, is only 31 per cent in Sweden, as compared with 54 per cent in America.

Maine is the original home of the American tooth pick industry and has the largest tooth pick mills in the world, with a capacity of 170,000,000 tooth picks per day. White birch is the principal species used and one cord yields about 9,000,000 tooth picks.

The production of paper in the United States dropped from 11,140,235 tons in 1929 to 7,900,000 tons in 1932.

Climbing vines turn from left to right in the Northern Hemisphere and from right to left in the Southern Hemisphere.

The petrified forest of Arizona contains 25,625 acres.

The wood of the dogwood tree is heavier than hornbeam, black locust, or white oak. A cubic foot of air dry dogwood weighs 52 pounds; hornbeam weighs 49 pounds, and black locust and white oak each weigh 48 pounds per cubic foot, air dry.

White cedar and western red cedar are two of the lightest of native commercial woods. They each weigh 22 pounds per cubic foot, air dry.

Because of its peculiar odor sassafras wood in early days was used widely in certain sections of the country for making bedsteads because it was said to repel bedbugs—Service Letter (Pa.).

Trees cannot flee from fire, but must stand and take it. If the firebug were scorched by some of his own fire, maybe he would become fire conscious.

SECOND DISTRICT

Everett B. Stone, Jr., Dist.
Forester
Gainesville

Pine Pulpwood Sent to Pulp and Paper Plant at Savannah from Town and Union Counties

A cord of Virginia pine (*Pinus Virgiana*) was hauled by motor truck to Savannah for experimental manufacture of pulp and paper. This wood was furnished by the Pfister and Vogel Land Company who own 65,000 acres of forest land in Towns and Union counties, Georgia. The cost of transportation was provided for by donations from citizens of the two counties. It is believed that a high grade of paper can be manufactured from this species of pine.

Plantings on Chicopee Forest

Pine seedlings were planted on Chicopee forest in Hall county by the Chicopee Manufacturing Corp. During March 12,000 Loblolly pine and 2,000 slash pine seedlings were planted. This is in addition to 5,000 shortleaf pine and 1,000 white pine seedlings planted last fall.

Rubbish Burning Starts Forest Fires

The spring forest fire season opened with dry windy days in March. One of the major causes of fires at this season of the year is brush burning by farmers in clearing land or burning rubbish. Owners of forest land are manifesting more interest than ever before in protecting their woodland from forest fires, and if each owner would endeavor to protect his lands from the spread of rubbish fires the number of fires occurring and the area burned over would be greatly reduced.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

Review Read

Each month portions of the "Forestry-Geological Review" is read over Radio Station WRDW in Augusta. The district forester has had quite a number of interesting comments concerning this feature of the weekly radio talks, and several names have been added to the mailing list of the Review as a result.

Forestry Society Meeting

The district forester attended the recent meeting of the Southern Appalachian Section of the Society of American Foresters meeting held in Columbia, S. C. on February 24 and 25. The entire program dealt

with the management of game and its relation to the forest and was exceedingly interesting throughout. The principle address at the banquet on Friday evening was given by D. R. Coker, land owner of Camden county, S. C. Saturday morning the visiting members of the society made a trip out to the White estates, which is under the management of L. J. Leffelman. There inspections were made of fire breaks, plantations of pines, the nursery and the feasibility of growing game and trees at the same time was proven. After a most excellent table set by Mrs. Leffelman, the party returned to Columbia visiting the South Carolina State Tree Nursery at Camden.

Falling Creek TPO

In Jones county recently a new Timber Protective Organization by the name of "Falling Creek" was formed. The land owners have agreed to purchase six fire pumps and construct 28½ miles of fire breaks around and through the area under protection. This organization was effected through the work of the new Assistant State Forester, H. M. Sebring.

Fertilization Experiments

The Southern Cotton Oil Company of Augusta, is cooperating to test the growth of pine trees under fertilization. They are furnishing several kinds of fertilizer to be used on the slash pine trees planted last winter on the Gwinn-Nixon State Forest in Richmond county. Measurements on the growth of these trees will be made yearly and will be obtainable at any time from the district office in Augusta.

RECLAIMING USED TURPENTINE CUPS

Mr. Thos. L. Waters, vice president of the Lurton Company, Pensacola, has evolved a new plan for reclaiming second hand turpentine cups by dipping them in lead. It is Mr. Waters' impression that second hand cups can be reclaimed in this way at a nominal cost, using either 100 per cent pig lead or 90 per cent pig lead with 10 per cent black tin.—Naval Stores Review.

Idle acres and forest fires assure a sustained yield of poverty.

Forest fire insurance may be obtained cheaply by a little thoughtfulness and precaution.

Burning off the land is one way to eradicate profits and reverse the back to the farm movement.

SIXTH DISTRICT

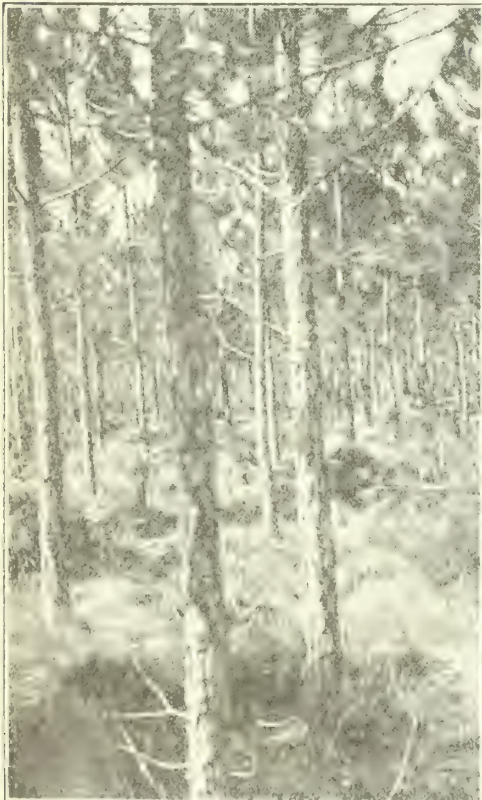
Jack Thurmond, Dist. Forester
Savannah

Thinning in Long County

Mr. Jim Parker, Secretary-Treasurer of Long County Timber Protective Organization, has thinned 1300 acres of young slash timber.

Some of the timber thinned is very young, not over three years old, and brush-hooks were used, which made the cost of the thinning operation low. Timber which averaged about ten years old was thinned to a 10 x 10 spacing and will now stand for several years before another thinning will be necessary. The cost of a thinning in ten-year old slash pine as Mr. Parker does it is \$1.00 per acre.

All of the timber land owned by the Parker-Howard Turpentine Company has been under protection in the Long County T. P. O. for the past three years and there is a perfect stand of young slash pine on their 9000 acres which has come in during the absence of fire. Their big problem now in addition to fire protection is thinning, for as a stand of young timber begins to slow down in diameter growth it must be thinned to stimulate more rapid growth. It is hoped that within a few years one will be able to utilize all the timber which must be cut out in thinning.



Newly Thinned Stand of Slash Pines—
 Excellent Spacing for Rapid Growth.

Tar City F. F. F.

A Forest Fire Fighters Organization has recently been formed in northeastern Tat-

all county, which includes five members and has a total of 4,500 acres. Mr. M. V. Overstreet of Manassas is president and Mr. Waldo Bradley of Hagan is the secretary. Five fire pumps have been purchased by the organization and distributed at strategic points for use in fire fighting. Several of the members have been protecting their timber from fire for the past several years and Mr. Overstreet and Mr. Bradley have planted some 300 acres to slash pine.

New School Forests Established

Forests have been surveyed for colored school at Soperton, Millen and Darien to be used for demonstrating the practice of forestry and in teaching the school boys something about the value of the trees in their county. Each school plans to erect a sign to call attention to the public that the school forest is under management and asking their cooperation in fire protection. Seedlings will be planted by the students during the winter months and instructions will be given the boys in tree identification, fire protection, growth studies, measurement of standing timber and uses of wood. They will also have an opportunity to study the effect of forest fires on diameter growth of timber. Each school will conduct thinning work as part of their forestry course.

Season For Burning Over

Lest some of the people of our State forget, the lawful season for burning went out on March 1st and was only lawful then after one had given his neighbor 48 hours written notice as to the time one intended to burn, so that the neighbor could protect his property from the fire.

It is now unlawful to burn the woods for any purpose, as the season only runs from January 1st to March 1st with restrictions.

SEVENTH DISTRICT

C. Bernard Beale, Dist. Forester
Waycross

Cup-Hanging Late

Operators have been late getting their cups hung this season. During the latter part of March, many stands of trees with only the aprons on were to be seen. The delay is due to the great amount of "virgin" put up this year, which operation involves much more labor and time than the single raising of cups on high-face operations.

Thinning Practice Increasing

Quite a deal of thinning has been done this season. Sapling stands 8 to 15 feet in height have been the usual size of trees thinned. The general practice seems to be to thin out the trees so they will be spaced about 10 feet apart. On the Timber Products Co. land near Cogdell, an area of several hundred acres has been thinned to varying densities. T. Tanner near Axson, is thinning out his sapling thickets and in the vicinities of Manor and Bannockburn

many farmers are thinning out their crops of pine saplings.

Pine Plantings

Among those known to be planting slash pine in this district this season are the following: Turner and Langdale, Mayday; H. M. Peagler, Jr., Astoria; H. M. Peagler, Sr., Homerville; C. R. Britt, Hickox; Superior Pine Products Co., Fargo.

Farmers are beginning to appreciate slash pine as an ornamental and shade tree. In several instances, farmers have set out slash pines along fences and about their houses. Most of the pines thus planted are too large, but possibly with great care they may be induced to live.

A heavy rain at the soil erosion experiment station near Tyler, Tex., recently washed from cotton fields on moderately sloping land more than 6 tons of soil per acre, reports the United States Department of Agriculture.

Cypress is considered highly resistant to termites, and for this reason is a favored wood in the tropics where termites are most active.

A hindrance to making the public "forestry minded" is wooden heads.

The best way to treat tree cancer caused by forest fire is to prevent the cause.

According to the United States Department of Agriculture, the gross income to the farmer from cotton and cottonseed in 1929 was \$1,389,000,000. In 1932 the gross income from these commodities was only \$397,000,000, a shrinkage of 72 per cent.

When we get to using Woodin money we'll have to start shaving accounts. — Southern Lumberman.

The annual meeting of the National Conference on State Parks will be held May 25, 26 and 27 at Bear Mountain Inn in the Palisades Interstate Park on the Hudson River, New York State.

TERPENE COMPOUNDS FROM SOUTHERN PINE

A number of new terpene compounds have been developed by the Hercules Powder Company.

The terpenes, recovered from the Southern pines, present an array of organic materials capable of extensive chemical and commercial use. Alphapinene, now used in large amounts for synthetic production of camphor, is an example.

Other materials are abietic acid, borneol, bornyl acetate, bornyl chloride, dipentene, fenchyl alcohol, fenchyl acetate, fenchylamine, fenchone, methyl abietate, terpin hydrate, alphaterpinene, alphas-

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

GOLD IN GEORGIA

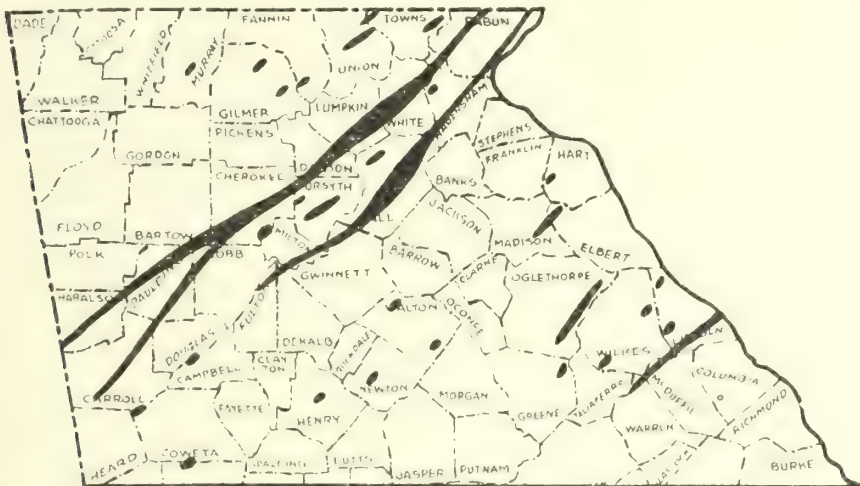
Part I

By GEOFFREY W. CRICKMAY,
Assistant State Geologist

As everybody knows, gold is the standard of American currency. The value of gold expressed in dollars and cents remains always the same—\$20.67 an ounce; but in terms of commodities its value fluctuates with "good times" and "hard times". In periods of depression, such as that in which the world now finds itself, the purchasing power of gold is greatly increased; consequently, abandoned mines can be reopened and old gold fields reworked at profit. It must be remembered, however, that the

gold? How is it mined? Can wages be earned by panning gold from the creeks of Georgia? But most frequent of all is the question: How is the mineral recognized?

Unlike most other metals, gold occurs in nature uncombined with other elements, that is, in a native state (with the exception of a few rare tellurides). The mineral possesses a golden yellow color with a metallic lustre. It is soft and malleable, a property that distinguishes it most readily from pyrite (fool's gold) which is hard and brittle. A particle of gold can be hammered out on an anvil to paper thinness, whereas pyrite, similarly treated, would be crushed to a powder. The same treatment will distinguish gold from scales of golden-col-



Map of North Georgia showing the distribution of gold deposits (after S. P. Jones, Georgia Geol. Survey, Bull. 19, 1909)

margin of profit in such cases is entirely dependent on depressed prices, and profitable mining is as transient as these prices are. These conditions do not justify large-scale development with large capital investment in machinery, but they do favor small-scale operations for which no great initial outlay is necessary. It is to the small-scale operator, to those otherwise unemployed who seek to earn wages by washing gold from the earth, and to those who have a more casual interest in gold and gold mining, that the following remarks are addressed.

The present widespread interest in gold is reflected in the great number of inquiries that have come to the office of the State Geologist during the past few months. It is here proposed to answer some of the common questions asked: Where and how does gold occur? How does one test for

ored mica with which it is more often confused. In actual practice, the prospector recognizes the metal by its color and lustre which are distinct from all other minerals, including pyrite and mica. It is more than seven times heavier than quartz, its most common associate, but as it usually occurs in minute particles, this high specific gravity is not easily recognized. The gravity separation of gold from quartz and other minerals by washing with water in a goldpan or sluice box is entirely dependent on such differences of weight. The mineral is reacted on by very few chemicals, of which chlorine and potassium cyanide are the most important from the standpoint of milling. Ordinary acids do not attack gold, but mercury will dissolve it readily. This attraction of gold to mercury has long been known and is employed in separating the gold particles, particularly the very fine

grains, from the waste rock or gangue.

Many kinds of rocks in all parts of the earth contain mineral gold in minute quantities. Even sea water contains traces of the metal (about an ounce in 8,500 tons of water). However, gold ore deposits, that is, deposits that can be worked profitably, are restricted to comparatively small areas. The Southern Appalachian region, including parts of Alabama, Georgia, the Carolinas, and Virginia, was one of the first producing areas in the United States. In the richest part of this field, at Dahlonega, Georgia, the United States government established a branch mint (a branch mint was also established at Charlotte, N. C.) which during the 23 years of its operation (1838-1861), minted a total coinage of more than six million dollars. Following the development of the richer western fields, Georgia lost and never regained its commanding position as a gold producing state. At the present time, contrary to popular opinion, an almost insignificant fraction of the country's total production is obtained within the state.

The gold deposits of Georgia are of two main types: (a) Lode deposits, consisting of quartz veins in solid rock; (b) placer deposits, comprising gold-bearing sands and gravels in stream valleys. Placer deposits are derived from lode deposits simply by weathering and disintegration of the quartz veins, the transportation and sorting of this debris by streams, and its deposition in the stream valleys. In all cases the lode deposits are the original source of gold, and consequently the distribution of gold quartz veins determines to a large extent the location of placer deposits. The accompanying map shows the location of the most productive areas in the state. It is noteworthy that the mineral is largely restricted to certain belts, the most important of which are the Dahlonega belt, extending from near Tallapoosa, northeastward through Dahlonega to Rabun county, and the McDuffie county belt, extending through portions of Warren, McDuffie, Wilkes, and Lincoln counties.

These belts are made up of ancient banded rocks known to the miner and geologist as schists and gneisses. In the Dahlonega belt the gold is closely associated with a gneiss containing a dark green to black mineral known as hornblende and the rock is called a hornblende gneiss. However, hornblende gneiss does not occur in all the gold belts, nor does its presence by any means insure the existence of gold ore. In a general way, the gneisses of the gold belts are finer-grained than those of the intervening areas for they have suffered certain shearing movements that have made them particularly accessible to gold-bearing solutions from deep within the earth. The trend of these gneisses and schists is northeast-southwest, and the trend of the lode deposits within them is roughly in the same direction. The dip of the gneisses is nearly

everywhere steep to the southeast (average 55° in Dahlonega belt) and the ore bodies conformably dip in the same direction.

It is advisable for the prospector to confine his search within the gold-bearing areas shown on the map, for in view of the fact that the state has been prospected for more than one hundred years, it is quite unlikely that any important new ore-bodies will be discovered. In any attempt to rework an abandoned deposit, it must always be remembered that the early prospectors did a thorough job and that mines or placers were abandoned only when they became unprofitable. Romantic stories of fabulously rich lost mines and fantastic tales of Indian gold handed down from one generation to another should not influence the honest and critical investigation of the small-scale operator, for no large returns are to be expected. To a limited extent, the gold fields of the state offer an opportunity to earn small wages during the present period of decreased costs and general unemployment.

In a second section of this article on Gold in Georgia, the writer will review very briefly the nature of the deposits most easily worked on a small scale, the manner of testing these deposits, and the best methods of extracting the gold. Those who desire detailed information on the gold deposits of the State should consult Bulletin No. 19 of the State Geological Survey by S. P. Jones. There are a number of books on the subject of gold mining that may be consulted for more general information. A recent circular by the U. S. Bureau of Mines¹ should prove particularly helpful.

¹Small-Scale Placer-Mining Methods
Chas. F. Jackson and John B. Knaebel, U. S. Bureau of Mines Information, Circular 6611, April, 1932.

A LEAK IN THE SPIGOT (Editorial Columbus Ledger)

In the praiseworthy movement to build up the trade area of Columbus, an important part in the connection is that of affording to the farmers of our surrounding counties every possible assistance in the better management of their farms and the marketing of their products. Columbus and the farmer will both profit from such a program.

In this connection, the attention of our civic factors and population generally might be called to an evil that is annually robbing the citizens of our county and section of a considerable wealth — an evil which all who can might join to give their influence and assistance in correcting.

During the year just ended, forest fires burned over approximately 40,000 acres of woodland in Muscogee, Chattahoochee, Talbot and Harris counties, to cause an estimated damage of \$43,000 in killed trees and retarded tree growth, in addition to

losses of burned cordwood, farm buildings, fences, forage and damage to game and fish from forest fires.

The figures are from the office of District Forester W. G. Wallace of the Georgia Forest Service, who has his headquarters in the courthouse in Columbus, and who informs that several communities are reducing the number of these fires by co-operative protection in co-operation with the state Service.

Most of the aforesaid losses are borne directly by the landowner himself and tenants, but there is a further loss of untold thousands of dollars resulting in the form of flood damage, dried-up water courses, and the rendering of navigable streams unnavigable due to deposited soil brought by flood waters from burned areas and hill-sides that are unsuitable for cultivation.

The landowner and general public are today feeling the effects of destructive forest fires that have occurred in years past. In the years to come, we will suffer great losses, the effects of fires occurring today. We can, however, avert these losses in the Chattahoochee valley by carrying out a program of education and public co-operation in controlling and outlawing forest fires.

Merchants and manufacturing enterprises of Columbus as a trade center can, estimates Mr. Wallace, easily figure their net annual income at least \$100,000 less than it would have been, this loss being traceable indirectly to forest fires. The landowner who fires his woods, or allows them to be burned over either through carelessness or improper management, suffers a loss by one fire the equal of which in money would pay his taxes over a period of years for the area burned.

It is not only the interests of the forest landowner that are at stake, but there is contained a direct challenge to the future welfare and wealth of every individual in the section.

The French are noted for their thrift; we Americans are noted for our extravagance as to natural resources. China is known for her barren hills and resulting floods and droughts traceable to widespread deforestation in centuries past. There is, fortunately, no danger of such a deforestation in the Chattahoochee valley as China now suffers. Georgia is particularly blessed in having several species of pines and broad-leaved trees that readily reforest most areas with little or no attention by human beings except protection from fire. The one great enemy to this natural reforestation is fire which easily kills the tender seedlings.

Many thousands of people are expected to be attracted to Georgia during the celebration of her 200th anniversary this year. The opinions they form here will guide the investment of many future dollars, and the routes of succeeding tours. Every forest fire and every burned area the visitor sees can make nothing but a bad impres-

sion upon his mind—bad publicity to be carried out of the state.

But every green, healthy, well-stocked forest he sees will serve as a pleasant background for his thoughts and leave a pleasing picture in his memory of Georgia and the Chattahoochee valley.

The forest landowners along the Franklin D. Roosevelt Highway especially are called upon to co-operate to hold down and eliminate the burning over of their woodland areas.

Let us stop the leak in the spigot.

LUMBERING UNDERTAKINGS IN SOVIET RUSSIA

An interesting article by Dr. C. A. Schenck, former head of the Biltmore Forestry School in North Carolina, appeared in a recent issue of the *Hardwood Record*, treating of the lumber industry of Russia of which he had made a study.

Slightly more than a year ago the Russian administration of lumbering and forestry was transferred to a new and independent department or commissariat, known as "Narkomles," under whose jurisdiction were also placed the paper and wood chemical industries. This was the fourth time within two years that all lumbering and forest industries in Russia have been organized. "Narkomles" has five divisions: logging and forestry, lumber industry and wood chemistry, pulp and paper industry, working plans, and business management.

According to Dr. Schenck, lumber production in Soviet Russia has failed to reach the expectations of the five-year plan. The country cut only about 70 per cent of the amount called for in the plan and deliveries were only about 63 per cent. One reason given by Dr. Schenck for this condition is the poor state of forest transportation. Teams are not available and logging by machinery, tractors, and caterpillars is undeveloped.

FOREST TERMINOLOGY

Seedling—a tree, grown from seed, not yet 3 feet high.

Shoot—a sprout, not yet 3 feet high.

Small sapling—a tree from 3 to 10 feet high.

Large Sapling—a tree 10 feet or over in height and less than 4 inches diameter at breast height.

Small pole—a tree 4 to 8 inches diameter, breast height (d.b.h.)

Large pole—a tree 8 to 12 inches, d.b.h.

Standard—a tree 1 to 2 feet d.b.h.

Veteran—a tree over 2 feet d.b.h.

Seedling stage or seedling growth — stand of seedlings.

Thicket stage or brushwood—a stand of saplings.

Smoke of forest fires in the nostrils of eyes, is no way for a tourist to smell or see this country first or last.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 3

ATLANTA, GA. MAY, 1933

No. 5

FOREST EMPLOYMENT RELIEF PROGRAM

Georgia's Quota of Men 6,000 on Two-Year Program — Work on State Properties and Possibly on Private Lands where Owners are Cooperating with Federal Government in Forest Fire Protection — Several 200-men Camps Are Planned

The great nation-wide project of forest employment as a relief measure is rapidly getting under way with the primary object of giving 250,000 young men gainful employment. It is one of President Roosevelt's plans for federal aid in meeting the unemployment situation. Far better than a hole is work. No better place for work and for mental, moral and physical conservation of young men can be found than in the forests.

Two general fields of forestry work are planned, that of national forests and parks, and that provided by the states. Work on the national forests and parks is under federal direction; that within the states and outside of national forest and park areas, is under the direction of the state foresters.

Georgia has two national forests, about 350,000 acres of which are in Georgia; one, the Nantahala, with headquarters at Franklin, N. C., and the other the Cherokee, with headquarters at Athens, Tenn. Four 200-men camps will be used in the national forest area in Georgia.

How many 200-men camps will be established in Georgia outside of the national forests remains to be determined. The State Forester has submitted plans to the federal office in charge, but at the time this publication goes to press approvals have not been received.

State Projects

The state projects submitted call for employment of men on state parks, the state forest, state tree nurseries, timber protection organizations and forest fire fighters organizations. The state parks are Indian Springs in Butts county, Vogel Park at Steel Gap in Union county, Alexander Stephens Memorial Park at Crawfordville in Taliaferro county. The only state forest

(Continued on Page 2 Col. 1)

STATE FORESTER MADE SECRETARY OF COMMISSION

Secretary Assigned Executive Duties of Department of Forestry and Geological Development in Addition to Work of State Forester.

At the quarterly meeting of the Commission of Forestry and Geological Development, B. M. Lufburrow was made secretary and assigned executive duties of the department. His duties as state forester are not changed by reason of the appointment.

The office of secretary is assigned by law to the state geologist or the state forester. State Geologist McCallie, who has served as secretary since the department was reorganized, asked to be relieved of his secretarial duties.

In view of the fact that there was need of some one person to represent the three divisions, the Commission made State Forester Lufburrow secretary with executive power to relieve members of the Commission of some of the duties which they have performed, as well as to assume other responsibilities of an executive nature.

NEW SYNTHETIC CAMPHOR PROCESS DISCOVERED

Synthetic camphor is made from gum products of southern slash and longleaf pine—made principally in Germany.

John J. Ritter of New York University announces a new camphor-making process which he says "will doubtless aid materially in establishing the camphor industry in the United States where it logically belongs."

About half the camphor now imported into the United States is produced from American turpentine in foreign chemical factories. It is claimed that the new process for making synthetic camphor is more direct than those now in use and produces a higher grade product at lower cost.

It was pointed out by Prof. Ritter that an American Camphor industry would benefit from the increasing laminated safety glass that promises an unprecedented demand for camphor. Other important domestic uses include explosives, celluloid, lacquers and movie films.

COOPERATION IN FORESTRY EXTENSION

State Forest Service joins with Agricultural Extension Service and United States Department in Farm Forestry—Three Foresters Assigned Work

The Georgia Forest Service, the Agricultural Extension Division of the State College of Agriculture and the United States Department of Agriculture are now cooperating in carrying on forestry extension service in Georgia. Hitherto the forestry extension work was conducted by the Division of Agricultural Extension of the State College of Agriculture in cooperation with the United States Department of Agriculture, from Athens. The Georgia Forest Service has joined these agencies, and the work in the state is now directed jointly by the two state agencies with most of the administration work centering in the Georgia Forest Service with headquarters in the State Capitol.

Three extension foresters have been selected to carry on this type of work, which is distinct from the regular work carried on by the Georgia Forest Service. Extension foresters are to promote farm forestry. To this end close cooperation of extension foresters with county agricultural agents will be maintained.

Bonnell Stone, Oxford, a well known leader in forestry in Georgia, has been selected as chairman of the forestry extension group. His headquarters are at Oxford and his territory is a group of middle Georgia counties given below.

Dupre Barrett, who has long been in the forestry extension work, will work in the upper Piedmont and mountain section of the state. His headquarters are at Athens, Ga. Mr. Barrett is a well known forester who has rendered services to many farmers in Georgia for a number of years.

K. S. Trowbridge is the extension forester for the naval stores belt, or south Georgia. His headquarters are at Tifton. Mr. Trowbridge is working on naval stores problems especially. He was formerly an extension forester of the State College of Agriculture, but more recently a county agent.

(Continued on Page 2 Col. 2)

Forestry-Geological Review

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FOREST EMPLOYMENT RELIEF PROGRAM

(Continued from Page 1)

in Georgia is located at Augusta. The two state tree nurseries are at Albany and Blairsville.

Plans have been formulated on the assumption that relief work will be extended to private lands where the landowners have cooperative plans with state and federal agencies in forest fire control. In Georgia, lands of timber protective organizations and forest fire fighters organizations are listed for possible work under terms of an agreement that obligates the private owner to maintain or keep up the work in the future.

If and when work on privately owned timberland is permitted, it is the policy to extend the area of existing protected lands so as to establish large units that may have the smallest overhead cost in future forest protection.

Men Qualified to Enlist

Information received indicates that Georgia's quota of men for forestry work is 6,000. The period of employment may extend for two years. The age limit is 18 to 25 years and men enlisted for work must have dependents, sending to these dependents \$25 of the monthly salary of \$30.

Camp Equipment

Men enlisted for forestry projects will be in the charge of the United States Army

which will condition applicants at army posts for two weeks, and have charge of the men in the numerous 200-men camps. The direction of work will be carried on by foresters. Food, clothing, shelter, medical service, recreational facilities, will be provided under the supervision of the army. It is the purpose and plan to have the best type of camps, with good food, sanitation and every necessary camp facility.

The camps are to be located at one place at least six months and transportation of laborers to surrounding areas will be provided by army trucks. These camps may be shifted to new areas after six months but if projects justify it, the camps can remain longer.

If plans are carried out, a considerable part of the work in Georgia will be directed to building permanent firebreaks on large units of forest land, so mapped out as to give these large areas a uniform and efficient system of fire protection, leaving the timber owners to construct secondary fire breaks on their own land. The timber owners are obligated in advance to maintain the firebreaks that may be built.

Georgia Representation

Georgia was represented at the initial conference on the forest project at Washington by State Forester B. M. Lufburrow and by T. G. Woolford, president of the Georgia Forestry Association, appointed by Governor Talmadge. Both of these delegates took an important part in the proceedings and looked after the interests of Georgia in getting its full share of men and expenditures in the state.

Place to Enlist

The enlistment of men for work on the forestry project is directed in Georgia by Herman DeLaperriere, Room 232, State Capitol, and not by the State Forester. Enlistments are made at county court houses by local relief agencies, each county being allotted a quota according to population.

COOPERATION IN FORESTRY EXTENSION

(Continued from Page 1)

The new arrangement brings all forestry work in the state into close cooperation and is intended to avoid duplication and to promote efficiency.

The counties in each district are as follows:

First district: Dupre, Barrett, Forester, Athens—Banks, Barrow, Bartow, Carroll, Catoosa, Chattooga, Cherokee, Clarke, Clayton, Cobb, Coweta, Dade, Dawson, DeKalb, Douglas, Elbert, Fannin, Fayette, Floyd, Forsyth, Franklin, Fulton, Gilmer, Gordon, Gwinnett, Habersham, Hall, Haralson, Hart, Heard, Jackson, Lumpkin, Madison, Murray, Oconee, Oglethorpe, Paulding, Pickens, Polk, Rabun, Stephens, Towns, Union, Walker, White and Whitfield.

Second district: Bonnell Stone, Forester,

Oxford—Baldwin, Bibb, Bleckley, Burke, Butts, Chattahoochee, Columbia, Crawford, Dooly, Glascock, Greene, Hancock, Harris, Henry, Houston, Jasper, Lamar, Monroe, Morgan, Muscogee, Newton, Peach, Pike, Pulaski, Putnam, Richmond, Rockdale, Schley, Spalding, Stewart, Talbot, Taliaferro, Taylor, Troup, Twiggs, Upson, Walton, Warren, Washington, Webster, Wilkes and Wilkinson.

Third district: K. S. Trowbridge, Forester, Tifton—Atkinson, Bacon, Baker, Ben Hill, Berrien, Brantley, Brooks, Bryan, Bulloch, Calhoun, Camden, Candler, Charlton, Chatham, Clay, Clinch, Coffee, Colquitt, Cook, Crisp, Decatur, Dodge, Dougherty, Early, Echols, Effingham, Emanuel, Evans, Glynn, Grady, Irwin, Jeff Davis, Jenkins, Johnson, Lanier, Laurens, Lee, Liberty, Long, Lowndes, McIntosh, Miller, Mitchell, Montgomery, Pierce, Quitman, Randolph, Screven, Seminole, Sumter, Tannal, Telfair, Terrell, Thomas, Tift, Toombs, Treutlen, Turner, Ware, Wayne, Wheeler, Wilcox and Worth.

CHEMICAL USES OF SPIRITS OF TURPENTINE

New Possibilities Opened With Discovery of exact Chemical Constituent of Spirits of Turpentine

Among the addresses delivered at the International Naval Stores Conference was one by Marcelle Barraud on "The Uses of the Spirits of Turpentine", an extract from which is as follows:

"The chemical uses of spirits of turpentine are relatively new since its exact chemical constitution has only been determined recently, and synthesis was only possible by working on the pure terpene. Although it is possible, using spirits of turpentine as a raw material, to envisage theoretically the manufacture of synthetic rubber and of a large number of products which may be used in perfumery and therapeutics, such as symene, thymol, menthol etc., the commercial preparation of one of two large groups of products is practical at the present moment; terpene and terpeneol, and synthetic camphor.

Terpene is a synthetic product made from spirits of turpentine by hydration in the presence of a solution of sulphuric acid of 23 degrees Baume. It is a white crystalline solid. Its principal use is in the manufacture of terpeneol, and it is used in small amounts in therapeutics of the respiratory passages."

If money is the root of all evil, how there be such a big crop with such small roots?—Southern Lumberman.

According to reports of the National Lumber Manufacturers Association, the business at lumber mills shows heavy increase.

FORESTRY QUESTION BOX

How many nationally owned forestry areas are located in Georgia and what is the total acreage?

The federal government has two national forests extending into Georgia, the Nantahala National Forest, with headquarters at Franklin, N. C., and the Cherokee National Forest with headquarters at Athens, Tenn. The federal government has two military posts in Georgia containing considerable forest land at Fort Oglethorpe in northwest Georgia and Fort Benning at Columbus. The federal government owns forest lands in Carroll county, acquired during the Spanish-American war as a rifle range, Kennesaw Mountain Park, near Marietta, and small areas at Fort McPherson, Atlanta; Fort Marion, Savannah, and other small areas having no forestry possibilities. In all, nearly three quarters of a million acres of land in Georgia are owned by the federal government.

What elements of fertilizer are lost when fire burns over a forest?

Nitrogen is released as a gas into the air. Nitrogen is an element that is comparatively scarce in the soil and has a large part to perform in the vegetative growth of plants. It has been estimated that fire consuming organic matter that has accumulated for three or four years, will cause the loss of 40 to 60 pounds of nitrogen per acre. If one should replace this by an application of a nitrogenous fertilizer, it would cost \$9 to \$13.

What trees are preferred by grazing animals?

Hardwood trees. The kind preferred by grazing animals are ash, maple, yellow poplar, elm, basswood, white oak, red oak, and shellbark hickory. Less desired are butternut, honey locust, black gum, shagbark hickory, scarlet oak, sycamore and chestnut.

Trees seldom browsed are blackjack oak, sawthorne, wild cherry, dogwood, ironwood, red gum, pawpaw and persimmon.

FIRST USE OF BUILDING LUMBER IN AMERICA

Undoubtedly the first building lumber in America, or to be more exact, the first building in which lumber was used, was the house erected in Santa Fe, New Mexico, in 540. This, of course, applies to the continent as a whole. To come closer to home, we find building lumber used in the construction of the house of the Franciscan convent, St. Augustine, Fla., which was erected in 1680.—Southern Lumberman.

PROTECTING FOREST WILD FLOWERS

Fire Greatest Enemy of Flowering Annuals and Shrubs — Georgia Woods Rich in Understory Beauty When Protected From Fire

When nature is protected from its great enemy, fire, its gratitude is expressed in flowers. Annuals and shrubs vie with each other in bedecking the forests and lanes.

Burning off the forest floor and open spaces, an unreasoning custom of some land owners, is not only harmful to tree growth, but a devastating blow to plants that beautify the forests.

Normal human beings enjoy flowers in their natural setting of green, and abhor the char of ruins; they love to see nature at its best, free to flower and flaunt its varied hues, but deplore the thoughtlessness that would deny nature this expression.

In March and April travelers on the highway rode in a haze with an unsavory smoke tang in their nostrils. The freshness of the open air of spring, delightful to everyone, was rendered distasteful. It took the high winds of late March to winnow the atmosphere of smoke, brighten the vision and bring the fresh odor of spring atmosphere for a short time. But soon the field fires, unrestrained to become forest fires, again brought on the blue haze of smoke rising from thousands of pyres that involved the sacrifice of life or vigor of trees and wild flowers.

Many of the blooms are forerunners of fruit on which the wild life of the forest subsists, whether the green leaves, seed or berries. Reduced food supplies mean reduced population of song birds, quail and various kinds of wild life. Even the few remaining are without the coverage so necessary to their protection from their natural enemies, because the fires have destroyed the coverts.

NEW PAPER SIZING PLANT AT VALDOSTA

The American Cyanamid Corporation has erected a new plant at Valdosta for manufacturing rosin into paper sizing that promises to make an important market for rosin. The plant has a capacity of handling 100,000 barrels a year.

Sizing is used in treating book and bond paper and logically should be manufactured in the south where rosin is produced.

The heavy hitters of the baseball teams can strike a blow in behalf of the forestry relief program by hitting hard enough to break the bats.

If there were some way to "denaturize" used beer kegs, the stave makers would enjoy a degree of permanent prosperity.

FORESTRY CAMP EXAMINATIONS HELD

Vocational Agricultural Students vie for Scholarships Paying Forestry Camp Expenses — List of Questions Submitted

The annual forestry examination to determine winners of forestry camp scholarships was held April 29 in which representatives of about 100 vocational agricultural high schools of Georgia competed. Winners will be entitled to attend a forestry camp in the mountains for three weeks this summer and three weeks next summer. Successful completion of the camp work will entitle the student to a certificate of Vocational Forester.

A list of the examination questions submitted this year is as follows:

1. Name 10 leading species of trees in your school territory.
2. Mention the species of pines that predominate in each of these geographical divisions: (a) Coastal Plains; (b) Piedmont area; (c) Mountain section.
3. Name 5 of the species of oak found in Georgia?
4. What are some of the trees growing in swamps in Georgia.
5. Give leading uses of the following species of trees: (a) White oak; (b) Hickory; (c) Red gum; (d) Cypress.
6. What is the most practical firebreak in your section of the State? Describe in detail how to make it.
7. Describe best method of chipping pines for naval stores: (a) Kinds of pines; (b) Minimum size of trees for chipping; (c) Best methods of procedure.
8. What species of pine would you recommend for planting in your territory?
9. Give methods of planting pines: (a) Care of seedlings; (b) Spacing; (c) Setting of seedlings.
10. Give various kinds of damage caused by forest fire.
11. When should you gather pine cones for planting seed? Describe appearance of cone when ready to harvest.
12. When is the best time to thin forests, and why?
13. How would you thin a young pine forest with a thick stand and about 15 feet high? (a) Spacing of trees; (b) class of trees to favor; (c) disposition of saplings cut.
14. What species of trees are most desirable for fence posts, poles and piling?
15. Describe your home project: (a) Size of area; (b) kind of trees; (c) seedlings planted; (d) firebreaks constructed; (e) thinning or improvement cutting.

Politicians seem afraid that President Roosevelt's tree planting program won't include enough plums. — Southern Lumberman.

FARM WOODLANDS OF GEORGIA AND THE SOUTH

Georgia has 23,750,000 acres of timberland and potential timberland, of which 8,372,937 acres are classed by the census as "Farm Woodland". This is the largest farm forest area of any southern state except Texas, which has 15,500,000 acres.

The proportion of farm land in forest in Georgia is 37.9 and the average woodland per farm is 33 acres. The entire area of the state classed as forest land is 63 per cent.

The number of farms in Georgia is placed at 255,598, exceeded by North Carolina with 279,708; Alabama with 257,395; Mississippi with 312,653; and Texas with 495,489.

The total area of farm land in Georgia is placed at 22,078,630, exceeded by Oklahoma with 33,790,817 and by Texas with 124,707,130.

COURT DECISION ADMITS COOPERATIVE MARKETING

The decision of the United States Supreme Court in the Appalachian Coals case, admitting the justice of cooperative selling as a preventive of destructive competition is regarded as opening the way to less destructive marketing of timber products.

Commenting on the decision, Wilson Compton, president of the American Forest Products Industries, says:

"The decision in the Appalachian Coals case removes one of the greatest artificial handicaps under which the forest industries and others similarly situated have labored in their effort to free themselves from a mass of oppressive burdens. They will now be free to go ahead with reasonable cooperative selling and other constructive agencies, in so far as they promise to promote orderly production and marketing, gradually eliminate the causes and relieve the consequences of destructive competition, and establish greater continuity of industry and greater security of employment. This is in public and private interest. The judicial recognition of the fact is the greatest gain in this decision of the Supreme Court."

NEW TREE DISEASE DISASTROUS TO BEECH

A disastrous disease coming in from Nova Scotia is considered to hold possibilities as great as chestnut blight in timber production. The victim this time is the beech. The invader is a scale insect which when it punctures the beech bark, lets in a fungus already present, but powerless in the absence of the aid of the insect.

According to a report of the U. S. Department of Agriculture, a third of the beech trees are already dead in Nova Scotia and the trouble is showing up in New England.

ASSOCIATION MEETING REPORT NEXT ISSUE

The May issue of this publication goes to press just previous to the annual meeting of the Georgia Forestry Association held at Savannah April 28, 29 and May 1. The June issue will carry a report of this meeting which apparently is to be the best meeting of the kind in the history of the organization.

GRAZING HARDWOODS HINDERS TREE GROWTH

It is the custom in Georgia to let cattle range through the forests, and it is common observation, especially in the hardwood sections of the piedmont and mountain sections of Georgia, that trees do not thrive under grazing.

U. S. Department of Agriculture Leaflet No. 86, prepared by W. K. Williams, entitled "Protect Hardwood Stands from Grazing", says "Farm woods continually grazed hold little promise of profitable timber growing.

"In grazed woods hardwood seedlings and sapling trees are noticeably absent. Under these conditions there is little chance for the woods to perpetuate themselves as the young trees are either browsed off, defoliated or trampled down.

"Constant trampling", the leaflet says, "exposes the tree roots, injures them and allows them to dry out. This results in poorer quality of timber and wood products, eventually weakens the older trees, and sometimes causes the top, and later the whole tree to die."

GERMINATION TESTS OF LONGLEAF PINE

J. L. Deen, Yale School of Forestry, reporting on germination classes of longleaf pine in the April Journal of Forestry, tested seed that numbered 5,076 per pound.

Individual seeds were grouped in ten classes according to weight. The viable seed in the lot in the six heavier weight classes was 79.47 per cent of the total number of seed. The first four classes representing the lighter seed and 20.43 per cent of the total number of seed, did not germinate at all.

The conclusion is that the light seed which have no ability to germinate, should be separated from the heavier seed with machinery usually employed in grading and cleaning farm crop seed.

"On the basis of these findings", says Mr. Deen, "the nurseries are justified in placing a maximum on the number of seed per pound that will be acceptable to them."

In a word, heavy seed are worth more than light seed, and cleaned seed should bring more than uncleaned or run-of-tree seed.

BACK TO FARM

The Bureau of Agricultural Economics of the United States has recently reported the farm population to have increased until it is now greater than at any time in the history of the country, exceeding the maximum hitherto recorded for 1910. The farm population as of January 1, 1933, is 32,242,000 compared to 32,076,960 in 1910.

A "RAKER'S" REASON

When a turpentine operator was asked why he raked around his trees, he replied: "It gives the niggers better toe holds."

Slipping on pine needles is no joke, but raking around the tree to provide a sure footing for the woodsman is.

WOOD VERSUS EARTHQUAKES

The heavy damage and loss of life by earthquakes occur where buildings are constructed of brick and stone. The least damage and loss of life is where buildings are constructed of wood. Wood construction ought to increase on the Pacific coast.

Only six per cent of the total land of Australia is in forests.

PULLED A BONER

The editor of this publication has received more than one reminder that James A. Fowler, the greatest slash pine planter in the world, is a resident of Treutlen rather than Emanuel county as printed in the April issue of the Review. The error is acknowledged and correction is hereby made. We do not blame Treutlen county for being jealous of the reputation Mr. Fowler has given that county.

CHIEF FORESTER SAYS OF FOREST RELIEF WORK

R. Y. Stuart, Chief Forester of the United States, speaking of the program of federal relief through forestry employment said:

"While the purpose of this big forestry work program is primarily unemployment relief, it by no means calls for 'made work' intended merely to keep men busy. The labor performed in the forests will render a great public service by helping to put the forests of the country in a productive condition which would have taken decades to attain under ordinary circumstances. It will help to check the huge losses we now sustain each year from fires and from floods. It is a work that should eventually yield direct and indirect benefits to the nation far beyond its present cost."

The red enemy of the forest which the recruits will soon meet is the chigger.

SECOND DISTRICT

**Everett B. Stone, Jr., Dist.
Forester
Gainesville**

New Timber Protective Organization

A new timber protective organization has been formed, embracing land in Habersham and Banks counties and embraces an area of 13,000 acres. It is believed that considerable acreage will be brought into the organization later on. Habersham county is noted for its large areas of apple orchards, but is approximately 78 per cent forest. A strong effort is being made to interest land owners in the protection and conservation of this large area. Fire patrols will be maintained.

North Georgia Nursery

The North Georgia Nursery in Union county will be operated this year mainly for the production of hardwood seedlings. The plans are to plant 30,000 black walnuts and 30,000 black locust. The demands for these species last year was considerably more than the supply available.

Mountain Flora in Bloom

Emerson has said, "Never lose an opportunity of seeing anything that is beautiful, for beauty is God's handwriting—a wayside sacrament. Welcome it in every fair face, in every fair sky, in every fair flower and thank God for it as a blessing."

In not missing an opportunity of seeing beauty in nature, one need go no farther than the mountains of north Georgia, for they offer a wealth of it. The middle of May one may ride up in the mountains and find at every turn azaleas and dogwood in all their glory. Then when the summit is reached and one looks down into the green valleys, there again is a myriad of pink and white—azaleas, dogwood and other flowers in perspective. This is true beauty.

THIRD DISTRICT

**C. N. Elliott, District Forester
Augusta**

Drainage Experiments

Recently a drainage experiment was made on the new Gwinn-Nixon state forest in Richmond county. Just beneath the top soil of this forest is a layer of "pipe clay", and 80 per cent of the land is covered with approximately six inches of water through the winter months. Underneath this clay is sand.

Dynamite was used to blast through the layer of clay. In order to pay for the operation of shooting holes in the clay, "lightered" stumps were blown out of the ground, chopped into kindling wood and

sold at wholesale prices in Augusta. The cost of the operation was as follows:

Price of dynamite, \$6.40; labor, \$1.00; total cost, \$7.40.

The returns from the kindling were \$5.75. The net cost of the operation was, therefore, \$1.65.

The experiment was a success. No water stood on the state forest during the past winter except in the very lowest spots and in the drains. From 90 to 95 per cent of the forest was dry.

Forestry Exhibit

A forestry exhibit was held in conjunction with the annual Flower and Vegetable Show at Augusta in April. The exhibit was of forestry products made from wood cells. A portion of the exhibit consisted of rayon, or artificial silk, cellophane, paper, paint, etc. Other products in the exhibit were pencils, lumber, handles, millwork, and miscellaneous small wooden articles.

School Forest Demonstrations

Mr. C. A. Whittle, educational manager of the Forestry-Geological Department, recently visited several schools in the Augusta district, where demonstrations were given by him and the district forester. Much interest was shown in the forestry project and in the annual summer camp to be held at Young Harris in North Georgia.

Augusta Delegates

Many prominent Augustans attended the annual meeting of the Georgia Forestry Association at Savannah. Among those who were present in the delegation were L. S. Moody of the Chamber of Commerce, Lynn Drummond, architect, Mr. B. B. Taggart, international figure in paper manufacturing circles, Mr. George Meade, president of the Meade Paper Company, Mr. Thos. J. Hamilton, editor of the Augusta Chronicle and a member of the executive committee of the Georgia Forestry Association, and the district forester.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Vocational Boy Plants Seedlings

Calvin Ellington of Emanuel County Institute at Graymont, Georgia, has planted 2,500 one year old longleaf seedlings during the past season on his father's farm.

Young Ellington is 16 years old. This is his first year in vocational forestry work and he has made a good start. In addition to his plantings he has constructed fire breaks around all the timber land on their farm and has succeeded in protecting it from fire through his protective work. He has also started an improvement cutting and plans to eventually remove all the scrub oak as he gets his longleaf seedlings planted.

Turpentine Without Raking

Mr. Jim L. Gillis, member of the Treutlen County T. P. O. and manager of the Soperton Naval Stores Company, has put up 10 crops of "Virgin" this year on timber land which has been under protection since 1928, and has never been burned over since the organization came into existence. A crop of turpentine cups consists of 10,000 faces.

Mr. Gillis used new cups and gutters and no tree under 10 inches in diameter was cupped, and he is working them in woods which have been rough for five years and **THEY ARE NOT RAKED**, as he gets adequate protection from fire through the organization and the trees produce a better grade of rosin and more gum when produced on unburned timber.

At the present prices of labor it costs \$35.00 per crop to rake trees and for 10 crops would be \$350.00. As an average it takes 350 acres for a crop and the raking cost would be 10 cents per acre. One can get protection from fire for trees to be turpentine at 5 cents per acre through a T. P. O.

Mr. Gillis saves on raking costs, thus cutting his overhead, and he will also get more gum and better rosin by working his timber **UNRAKED AND UNBURNED**.

Liberty T. P. O. Active

The secretary reports as follows:

"We are nearing the close of our third year of forest fire protection. To date we have had about 5 per cent of our protected lands to burn. This season's protection has cost the land owners less than 3 cents per acre. This small cost has been accomplished by burning out the breaks plowed in 1931 and 1932, and in some cases we used old roads running through the land as a base. We had good fire pumps which helped us very much in controlling fires during windy weather.

"We did very little new plowing this year. The cost for hired help ran from 60 cents to 80 cents per mile, being governed by the conditions of the weather and the roughness of the woods. All members of our organization have large areas that have not been burned since we began three years ago. Two members have not had any to burn this season and very little since we started. All unburned lands have beautiful and promising stands of young slash timber making remarkable growth.

"It seems to us that a careful comparison of these lands and lands that have been burned every year or two should convince any land owner that fire protection is a paying proposition. It seems a pity that so beautiful and fruitful a country as ours undeniably is should be so ruthlessly destroyed by its own inhabitants. Do we really love our country and county? We live in a mighty good section of a great state. Our soil will produce a limitless supply of timber and live stock to say nothing of the many other good things so easily

grown here. Forest fires are now and have in the past been our greatest hindrance in the successful development of the first two named products. It is a mistaken idea with some of us that baby slash pine trees will survive light burning. It is an argument that has misled some land owners. Young longleaf seedlings will often come through, but they will be badly stunted.

"We should grow timber not only for the purposes we are used to, but the prospect of large commercial paper mills being located in the south becomes more and more certain. Dr. Herty's experimental plant at Savannah, Georgia, is making wonderful success making paper from young pines. All of us may in a very short while be greatly surprised at the increased value of our timber growing lands.

"We should emulate each other in growing timber as in growing the best farm crops. Competition and mean selfishness are not the plan and purpose of timber organizations. It is a help each other and ourselves spirit that should appeal to every country loving citizen, as well as the land owner that wants his property to increase in value and be the source of a steady and easy income in the near future, but we shall have to learn to team up and pull together for the good things our soil will produce if we want to leave Old Man Depression to the forgotten past."

SMALL DIMENSION PRODUCTION STRESSED

The extension of the use of small dimension in mass production industries is becoming an economic necessity in the opinion of the National Committee on Wood Utilization of the Department of Commerce, under whose auspices a dozen leaders in the wood-using industries of the country have completed a Consumers' Survey on this subject, entitled "Industrial Uses for Small Dimension Stock." The subject of small dimension stock has been treated from the consumer's point of view. Basing its findings on extensive research, the committee summarizes its recommendations on the basis of actual cost comparisons between the old method of purchasing lumber from which small dimension is cut at the point of consumption and the purchase of small dimension stock manufactured at sawmills. Even during present conditions of low lumber values and labor costs, the purchase of small dimension stock represents an appreciable economy to the consumer in the majority of instances.

Conservation

From a national point of view it is pointed out that the manufacture of small dimension stock represents a further step toward forest conservation. With the nation's constantly greater dependency on new timber crops it becomes increasingly difficult to secure long lengths and wide

widths of material free from defects. However, since more than 80 per cent of the lumber for industrial purposes is used in lengths shorter than eight feet and clear lumber of small dimension sizes can easily be produced by cutting between defects, second growth timber is suitable for this purpose.

The committee emphasizes that the consumer should always have in mind that the cubic inch of waste at the consuming plant has cost him as much as a cubic inch of usable material, since charges for raw material, seasonable, freight and handling are included. Mass production methods demand a raw material which is ready available and in such form as may be quickly converted into the finished product. Small dimension stock serves this purpose.

BIRD'S EYE AND CURLEY MAPLE

Because the so-called bird's eye figure in sugar maple increases the value of the wood in which it is found and because trees with a bird's eye pattern are relatively scarce, logs containing this ornamental figure are highly prized by manufacturers of high grade furniture and interior finish.

According to the Forest Products Laboratory the bird's eye figure is the work of a parasitic fungus. Experiments are now being undertaken to isolate the fungus to permit the growth of laboratory cultures which may be used to inoculate trees to produce the bird's eye figure in the wood. So far, however, the majority of the investigations have been confined to microscopic examination of bird's eye wood.

Bird's eye maple and curly maple are not separate species of hard maple. The fact is that the bird's eye and blister effects are the result of cellular distortions probably caused by the fungus. A slightly wavy longitudinal course in the elements of the wood produces the condition known as curly grain, also frequently seen in maple.

—Service Letter (Pa.)

FORESTRY APPLICANTS FAR EXCEED QUOTA

As soon as the word "go" to would-be woodsmen desiring work under the banner of forestry was given, the applicants swarmed at the registration points. In Atlanta twice as many sought work as the allotment to Fulton county. Other centers of population had the same experience.

Apparently there are a large number of people who want work and are willing to take a hard job at comparatively small pay, such as the forestry project provides.

Rural counties of Georgia are strong in their demand for jobs. Many men thrown back on the farms from the cities are not needed on the farm where the crying need is for less work, so that the country's crop surpluses may be reduced.

DEMAND FOR NATIONAL PARKS ARE NUMEROUS

The National Park Service has before it forty proposals for national parks and fifty-four national monuments.

Three areas were approved in 1932, as follows: The Great Sand Dunes National Monument, Colorado; Grand Canyon National Monument, Arizona; and White Sands National Monument, New Mexico.

Those which have met the national park and national monument standards are the following: St. Croix Island National Monument; Maine; Morristown National Historical Park, New Jersey; Death Valley National Monument, California; and Cedar Breaks National Monument, Utah.

Wood Shrinkage

Green sugar maple shrinks about 15 per cent in volume when oven dried. Beech shrinks about 16 1-2 per cent, cherry 11 1-2 per cent, white elm about 14 per cent, hemlock about 9 per cent, and white cedar 7 per cent.

WATER REQUIREMENTS OF FOREST TREES

Writing in "Service Letter" of the Pennsylvania Department of Forest and Waters George S. Perry tells of the estimate frequently quoted in European forestry to effect that 1,200 tons of water per acre are transpired by a beech forest. Quoting, "This is equivalent to about 10.6 inches of rain fall per annum.

"Very few forest types transpire as much moisture as beech. Careful studies show that oak trees give off between 200 and 300 units of water for every unit of weight fixed in the organism.

"Taking values computed at the Forest Research Institute for growth of wood and leaves per year, with due allowance for twigs and roots, we find that the water thrown off into the air by an acre of oak forest varies between 780 and 1,170 tons annually. Probably 900 tons would be a fair average for forest stands on the rather droughty slopes with sand soil.

"Trees vary considerably among themselves as to water transpired. In order to add a pound to its body weight, a birch or basswood tree must give off 700 to 800 pounds of water, while pines would transpire only somewhat between 40 and 70 pounds to make the same growth.

"Woodsmen spare that axe" need not be urged upon the woods recruits. The command will be "Cease sparing that axe."

The old battle axe is swinging mightily against the depression around a thousand camps.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

GOLD IN GEORGIA

Part II

By

GEOFFREY W. CRICKMAY

In a previous article discussing the status of gold mining in Georgia, the writer has pointed out that to a limited extent the gold fields of the state offer an opportunity to earn small returns during the present period of decreased costs and general unemployment. In the same article, the distribution of gold deposits in Georgia was discussed and it was shown that the mineral is largely restricted to certain narrow northeast trending belts, in which occur lode and placer deposits.

flotation with oils. For these reasons, the lode deposits cannot be worked by those unfamiliar with such methods, nor by those with little capital to invest in machinery.

In certain areas, particularly in the Dahlongea belt, the lode deposits have been thoroughly decomposed near the surface to incoherent clay soil containing gold-bearing quartz, and are similar in many respects to the placer deposits described below. In some places this loose weathered material, known to miners as saprolite (strictly rotten stone), extends to a depth of 100 feet, and where it contains numerous stringers of gold-bearing quartz, it may form important ore bodies. The deposits are mined by directing a powerful jet of water through a large nozzle with constrict-

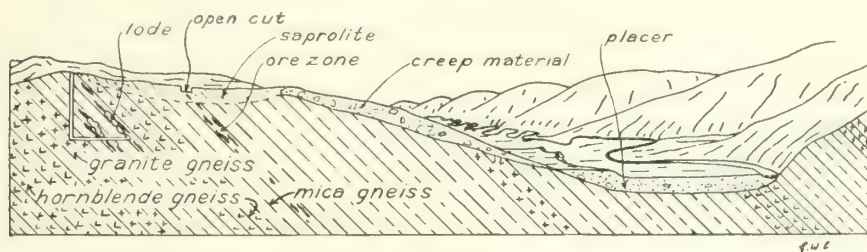


FIGURE 2.

Diagrammatic cross-section of a North Georgia stream valley showing the relations of lode, saprolite, and placer.

The lode deposits consist of either a single large quartz vein, or more commonly a collection of narrow lenticular veins closely spaced in an ore zone. The gold occurs as minute particles in the quartz and is usually quite invisible to the naked eye, although it can sometimes be seen with a small hand lens magnifying ten or twelve diameters. Quartz veins abound in all the gneisses and schists, and most of them do not contain any gold, so that in each case it is necessary to test the vein. In many cases gold is indicated by the presence of other metallic minerals, such as pyrite, pyrrhotite, and chalcopryite, and more rarely by galena and sphalerite. But even the presence of these minerals is by no means certain evidence of the presence of gold. The most practical test is to pan a crushed sample of the quartz vein, as described below.

The mining of these lode deposits requires the technical knowledge of an expert, for in most cases underground methods must be employed. The extraction of the gold involves crushing in a stamp mill and the collection of gold on an amalgam (mercury) plate or, with more refractory ores, treatment with potassium cyanide, or

ed opening, or giant, as it is called, on to the decomposed material, a method known as hydraulic mining. In this manner the loose earth, stones and gold are washed down; the fine material is passed through a sluice and washed, as with true placer deposits; the large quartz boulders are hauled to the stamp mill and treated in the same manner as ore from a lode deposit. This system of mining decomposed lode deposits by open cut methods was largely developed in Georgia, and for this reason is known as the **Dahlongea method**.

The placers, consisting of sand and gravel containing fine gold and nuggets, are the most important group of deposits from the standpoint of gold recoveries and they have yielded probably more than 90 per cent of the total production of gold in the state. In some gold areas, particularly in Alaska, the placers may occur in elevated benches or in channels that the streams once occupied but have since abandoned; but in Georgia nearly all the gold-bearing gravels are found near the level of the streams that deposited them, as, for example, those along Chestatee and Etowah rivers. The placers are found near the lode deposits for they have been derived directly from

them by the breaking down of the lode material by the action of weathering, the transportation of this debris by surface rain water and streams, and finally by its deposition where the stream currents are not strong enough to carry the heavier and coarser material down stream. In the process the rock is broken up and worn into sand and gravel, thus liberating to a large extent the gold contained in it. In transportation of the debris down the stream, there is a rough assortment of material that has been likened to the jiggling process of certain concentrating plants. The gold and other heavy minerals, together with the largest stones, are deposited first, that is, nearest to the lode from which they were derived; whereas the lighter and finer materials are carried on downstream. The river channel is nature's own sluice box, the means by which low-grade lode deposits are concentrated to comparatively rich placer deposits.

All the gravel deposits along the streams crossing the gold belts do not contain gold in workable quantities, and each deposit must be thoroughly tested before any extensive mining is started. To this end test pits are dug to bed rock at regular intervals and the material from each pit is panned for gold. The gold pan is shaped like an ordinary frying pan without a handle, but is broader—twelve to eighteen inches, somewhat deeper—two to two and a half inches, and the edges slope in at a lower angle. The material to be tested, either crushed quartz, saprolite, or gravel, is placed in the pan and the whole is submerged below water, preferably in a stream. The pan is then shaken to and fro so as to break up the material, and the stones and pebbles are picked out. The agitation of the sand remaining in the pan causes the lighter material to wash out over the edges, until finally only the gold and heavy minerals are left. The heavy residue is examined for "colors", which will be in the form of little flakes of native gold. The procedure is simple and yet there is a considerable knack to it that comes only with practice.

It has been estimated that one man can pan about one-half a cubic yard of gravel a day which means that, in order to make wages, the gravel must yield at least \$2.00 a cubic yard. Most of the placer deposits of Georgia contain less than \$1.00 worth of gold in a cubic yard and for this reason they cannot be worked profitably by such a slow and laborious procedure as panning. Some other method, by which a great amount of material can be moved and washed, must be employed. The most common is the sluice box, operated in conjunction with pick and shovel, drag-line, or giant and water lift to bring the gravel to the head of the sluice box.

A sluice box consists simply of a long flat-bottomed wooden trough 12 to 120 feet in length, arranged with a gradient of 4 per cent to 6 percent, that is, a drop of

from five to eight inches in each 12-foot section. The length, width and slope of the box depends largely on the type of material to be washed; a wide, shallow sluice is used for fine gold in sand; a narrow, deep sluice is best for gravel. On the bottom of the box is placed a set of riffles, constructed so that they may be removed when the sluice is cleaned up. A riffle is essentially a projection on the bottom of the sluice to collect the particles of gold and may consist of stones, poles, cut lumber, or angle iron, arranged either across or parallel to the length of the sluice.

The successful operation of a sluice box requires primarily a good supply of water and a land surface sloping sufficiently to permit the required gradient to the box. In the bottom of stream valleys where this gradient cannot be obtained, but where there is sufficient water, the sluice box is set on a trestle and the gravel pumped up to its head by a hydraulic elevator.

Where the gold is fine and the gravel coarse, it may be advantageous to place a grizzly at the head of the sluice box so as to remove the large stone. A simply-constructed grizzly consists of a number of short sections of railway track spiked down in parallel arrangement and about three inches apart. Where there is much fine gold the use of burlap, sacking, or blankets in the lower part of the sluice is sometimes resorted to, but in this case a screening system becomes essential. Mercury is commonly used in the riffles when the sluice is cleaned up to help collect the finest particles of gold which otherwise might escape.

Under particularly favorable conditions a deposit may be worked for less than five cents a cubic yard and with adverse circumstances the cost may be as high as a dollar a yard. Conditions vary with each deposit and the best method of mining represents a compromise between these conditions and the money that can be expended. The most practical method is largely determined by experiments and experience. The reader should not gain the impression that a vast opportunity exists or that large returns can be obtained, for neither condition prevails. The mining of gold requires, first, sufficient capital to tide one over early mistakes and misfortunes; it demands cautious judgement in selecting a point to start operations and, in most cases, the permission of the property owners; and it necessitates long hours of laborious and patient toil. Working under such conditions, those who associate gold mining with romantic adventure will soon be disillusioned.

In this article the writer has sketched very briefly some of the main features of the gold deposits of the state with particular regard for hand-labor methods of mining. The situation is more encouraging in the case of idle mines that, with a moderate investment, could be worked with modern machinery and up-to-date methods. In this way employment is created, not only in the

mines but also in related and dependent industries. Limitations of space prohibit a fuller treatment of the subject, but those interested may obtain detailed information or advice by calling at or writing to the office of the State Geologist, at the State Capitol.

WOOD PULP COSTS UNDER INVESTIGATION

In accordance with a Senate resolution, the United States Tariff Commission has been instructed to investigate the costs of producing wood pulp and related products in countries competing with the United States.

An investigation made by the commission a few months ago did not go into the question of production costs.

Pulp timber and woodpulp are on the free list and therefore are outside of the rate-fixing jurisdiction of the tariff commission.

MODEL TO DEMONSTRATE GROWTH OF TWIG

A twig 7 1-4 feet in diameter that puts on a year's growth in a minute and a quarter will be exhibited at the Centry of Progress Exposition in Chicago this summer. This huge model represents a 1-4-inch, 3-year-old basswood twig every microscopic detail of which is shown in cross section. The "growth" is accomplished by a mechanical process which increases the diameter 18 inches, adding "wood" on the inside and "bark" on the outside of the growing zone.

Each cell of the three annual rings of the wood, with its central pith and the radiating pith-rays, is outlined. At the circumference, between wood and bark, is the cambium layer. The fourth year's growth is shown by a series of sliding plates and moving pieces of canvas which take 75 seconds to come completely into view. The process can be reversed and the model restored to its original size, ready to "grow" again.

Forest Worker.

WHO WANTS BUFFALOES AND ELKS CHEAP?

The United States Bureau of Biological Survey has a surplus of buffaloes and elks. It is found that protection has so increased the supply as to create a surplus on game reserves, and these must be removed. Hence an offer of these animals to parks and museums at cost of transportation, and also a proposal to sell them to individuals. If a demand is not developed the animals will be slaughtered for meat.

ALPHARETTA SCHOOL'S FORESTRY ACTIVITIES

Teacher and Students Carry Out Varied Program of Work at School and on Home Projects — Large delegation Goes to Savannah.

By W. D. YOUNG, District Forester

Mr. P. L. Elkins, vocational teacher at Alpharetta has been quite successful in carrying out his school forest work. Mr. Elkins has 60 boys in vocational class, practically every one taking forestry. The school forest is on school property and embraces 31 acres.

Mr. Elkins induced each boy in his class to bring in one peck of loblolly pine cones and one-half gallon of popular seed. In this manner ample seed were secured for seed-bed planting and the remainder was sold, this money being divided among the boys and deposited in the class "Thrift Club Fund."

Later in the fall thinning was done on part of the forest. The wood was cut up and sold as stove wood in Alpharetta. About \$50 worth was sold in this manner, the money was divided among the boys doing the work and deposited in the Thrift Club Fund.

Sixty-four home projects were established by members of the class where thinning, planting and firebreak construction were carried out. About 6,000 seedlings were planted, the seedlings being taken from the woods. In addition to home project planting 1200 seedlings were planted on the school forest area.

Several fire fighters organizations were formed last fall in old Milton county. The school boys increased the area in these organizations by 1900 acres and 50 members by taking home a blank form for the purpose and getting their "dads" or neighbors to sign up.

This spring seed beds were constructed and a total of 720 square feet were planted to loblolly pine and popular. If germination is good, about 40,000 seedlings will be available next spring for planting.

The school forest has been kept free from fire. Firebreaks were constructed to aid in protection, and fire tools were bought, including fire pumps.

Mr. Elkins took 25 boys to the meeting of the Georgia Forestry Association at Savannah. The boys went down with Mr. Elkins in a big buss and the expenses of the trip were paid out of savings in the Thrift Club.

The above record shows that the teacher and the members of the class are taking a great deal of interest in forestry work, and have accomplished much constructive work during the school year.

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TWELFTH ANNUAL SESSION GEORGIA FORESTRY ASSOCIATION

Joint Session with Paper Makers of the North—Largely Attended Meeting, Enthusiasm High, Notable Addresses—Old Officers Re-elected and Augusta Selected for Next Meeting Place.

The twelfth annual meeting of the Georgia Forestry Association was featured not only by a splendid program of its own, but by a joint session with the American Paper and Pulp Association, and a technical exposition of the findings of the pulp and paper research laboratory of the Department of Forestry and Geological Development of Georgia, altogether making the meeting the most notable in the history of the association. It was a fitting part of the celebration of the 200th anniversary of the City of Savannah and the State of Georgia, the state with the greatest timber area of any in the union.

The famed hospitality of Savannah was generously sustained. Georgians and northern visitors were equally delighted.

The program was replete with encouraging information about the progress of Georgia in dealing with its forestry problems. Pioneers of the association were full of enthusiasm over dreams coming true.

The visit of paper manufacturers to Savannah, and a day's joint session of paper makers and tree growers gave the latter part of the meeting a paper making flavor. The paper makers acknowledged the truth of Dr. Herty's findings, admitted the possibilities of the south becoming an important source of newsprint, and welcomed further research to develop all the desired information against a day when paper manufacturers would find it possible to expand into regions of new pulp supplies.

Business men familiar with the economies of manufacturing, and timber growers with records of timber supplies and rate of tree growth, portrayed the advantages held by the south in paper making, doubtless convincing the paper men that the south has great potential possibilities.

Instructive exhibits of forest resources, forestry activities and the development of forestry products were an interesting and convincing feature of the meetings.

A number of business men representing several commercial bodies were in attendance, and in group meetings discussed ways and means of continuing pulp and paper research and of promoting forestry development of the state. The interest of these business men was at a high pitch.

Next year the association will meet at Augusta, and in the meantime, the same officers that served the past year, with T. G. Woolford as president, will continue their excellent service.

The twelfth annual meeting of the Georgia Forestry Association, called to order by President T. G. Woolford, Atlanta, was opened with invocation by Dr. Samuel McP. Glasgow, Savannah, and followed by an address of welcome delivered by H. L. Kayton substituting for Mayor Thomas Gamble. Mr. Kayton very cordially welcomed the visitors to a city celebrating the 200th anniversary of its founding and asked the pleasure of making the stay of those in attendance at the forestry meeting as happy as possible.

Responding, Judge Ogden Persons, Forsyth, accepted the welcome whole heartedly, and with delightful anticipation of enjoying the hospitality of the mother city of Georgia, famed for its beauty and the cordiality of its people.

Hamilton's Key Note Address

The next speaker introduced, Thomas J. Hamilton, editor of the Augusta Chronicle, gave the keynote address of the convention on "Forestry in Georgia", a short address replete with information, expressed in forceful and clear language. Sketching forestry movements in the United States and in Georgia, Mr. Hamilton complimented the founders of the Georgia Forestry Association for their vision and their achievements, the state forest service on the great work it is doing.

"This is certainly the time", said Mr. (Continued on Page 2 Col. 1)

VOCATIONAL FORESTRY SCHOLARSHIP WINNERS

Student Winner in each County Having Vocational Agricultural Schools—Camp to be held July 24 to August 12—Results of Forestry Examination by State Forest Service Announced.

The results of examination held April 29 for students of about 100 vocational agricultural schools in Georgia competing for vocational camp scholarships have been announced by the State Forest Service.

The Vocational Forestry Camp has been held for two summers at Young Harris College in the mountains near Hiawassee, Ga. A winner of a scholarship is entitled to attend two camp sessions and to win a certificate of Vocational Forester.

The camp this year will be held July 24 to August 12 at Young Harris College. The list of winners for this year is as follows:

Farris Carlan, Homer, Ga.; Robert Smith, Lorane; Ralph Johnson, Winder; J. W. Donaldson, Jr., Register; Barron Cochran, Girard; Render Rowe, Carrolton; Homer Winkle, Armuchee; Robert Poteete, Kennesaw; Elmon Vickers, Norman Park; Ashley Whitehurst, Adel; Jim Hulsey, Dawsonville; Chas. Head, Chamblee; Charlie Gunn, Vienna; Paul Jones, Middleton; Calvin Ellington, Summit; Howard Tatum, Dawsonville; John Broadwell, Alpharetta; Bill Oliver, Martin; Woodrow Osborn, Ellijay; Harrell Russell, Sonoraville; Quinton Rooks, Dacula; Eugene English, Demorest; Dorsey King, Lavonia; Solon Owensby, Franklin; Hardwick Floyd, Mystic; Oliver C. Anderson, Matthews; Elton Riner, Kite; Edwin Lloyd, Stockton; Virigree Coleman, Plainfield; Alton Hodges, Ludowici; O. M. Cates, Jr., Sale City; Huie Brand O'Kelly, Danielsville; Holland Tuck, Oxford; Paul Roby, Rabun Gap; J. H. Holloman, Richland; Perry Foster, Jr., Leslie; Cecil Parks, Howard; Tharan Connell, Pavo; Russel Willis, Ty Ty; Wilber Blount, Vidalia; Shad Calloway, Hogansville; Austin Avery, Adrian; J. L. Spence, Waresboro; Dock Akin, Hatcher; Paul Rees, Preston; Tom Strickland, Dalton; Frank Pullen, Cohutta; Thomas Bryan, Philomath; I. J. Medders, Sylvestor; Keith Barnett, Bogart; Sam Loyd Whitman, Eastanollee.

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C. A. Whittle, Educational Mgr.,.....Atlanta
H. M. Sebring, Asst. State Forester,.....Atlanta
E. B. Stone, Jr. Dist. Forester.....Gainesville
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W. D. Young, District Forester.....Rome
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James Dempsey.....Asst. Chemist

Extension Foresters

Bonnell Stone, Chairman,.....Oxford
Dupre Barrett,.....Athens
K. S. Trowbridge,.....Tifton

(Continued from Page 1)

Hamilton, "of all times to go forward for our great President who is leading the way toward conservation, reforestation and flood control by marshalling armies totaling some 250,000 men who will be put to work all over this country."

Summing up the ultimate objectives of the Georgia Forestry Association, he said:

"Vastly increase our timber supply and therefore, our state wealth. Through experimentation and research develop new uses for our forest products just as Dr. Herty is doing in Savannah.

"Turn barren, gully washed and worn lands into productiveness by crops of pines.

"Protect watersheds of our rivers by reforestation of denuded area to aid flood control, power and navigation.

"Provide preserves for game, birds, animals and fish."

In a future issue of this publication, a full reproduction of this address will be given.

State Forester Lufburrow on Natural Reproduction

What forest fire control will do and has done to reforest cut over and abandoned farm lands of Georgia was presented in a highly interesting and forceful address of State Forester B. M. Lufburrow, during the course of which he introduced three timber growers from various parts of the state to tell what had been their experience in obtaining natural reforestation.

Speaking to the faithful of the association, he said: "The realization of your fondest hopes of yesteryear are just ahead, for the state and nation are talking forestry as never before."

He said that it was fortunate that logging in Georgia had been limited largely to cutting only the larger timber, leaving sufficient seed trees to insure a second crop. He estimated that less than 10 per cent of the 23,750,000 acres of timber area of the state will require artificial planting.

The real problem of insuring a stand of young trees, he said, is to make provision for adequate fire protection. Where fire is prevented, abandoned farms are restocking at a surprising rate, but, he said, if all the young growth 3 to 15 feet high were measured, the total area of such land would probably not exceed two million acres.

He said that where the timber protective organization is now in force on approximately two million acres, fires are being controlled and natural reforestation is a gratifying result.

At this point Mr. Lufburrow introduced Ranger Cary C. Ernest of Blairsville, associated with the first timber protective organization in the state in Union county on the Pfister-Vogel lands, to tell what results had been obtained.

Mr. Ernest spoke of the effectiveness of the system employed, how previously fires were common but now a rarity, with sentiment strongly supporting fire prevention. As a result of fire protection, he said, restocking of the cut over area and abandoned farm lands had progressed rapidly and very satisfactorily.

Turning to the pine belt of lower Georgia, Mr. Lufburrow introduced H. H. Peagler of Waycross, a young man directing a large forest area, to tell of the results in the habitat of the slash and longleaf pine.

Mr. Peagler told of his firebreak construction and success with forest fire prevention, the result of which has been a splendid stand of young slash and longleaf pine coming in and growing thriftily.

Mr. Lufburrow next introduced E. E. Bozeman, Moultrie, as a man who had kept fires off his land and was interested in forestry in vocational high schools. Mr. Bozeman gave the result of his experience with fire prevention, the consequent good stand of rapid growing, thrifty pines and compared areas thus treated with neighboring lands where burning has been a common practise, where no reproduction and slow growth of existing trees were the results.

Mr. Lufburrow advocated in closing a program that will insure stumpage for turpentine operators, timber for sawmill men and material for pulp mills, which, carried forward intelligently, will mean maximum returns on the state's greatest natural resource, the forest.

Forest Management

C. C. Kuehn, Woodbine, Ga., operator of a large timber area in southeast Georgia, addressed the meeting on the subject of "Forest Management". The problem of forest management, he said, involves a careful consideration of all factors of cost, such as interest on investment, taxation, protection from fire, reforestation, and figure these against a reasonable expectation of yields; otherwise one might realize a loss rather than a profit.

Technical information should be obtained on which economic studies should be based, leading to a wise decision as to the products to be developed. Ample financial means, he said, must be available to carry the undertaking over the long period for developing returns.

A timber cruise and map of the tract to

be managed, he said, should be made at the outset. Steps should be taken to develop a sustained yield and a continuous market. He spoke of the need of more favorable rates on borrowed money to which the enterprise is entitled because of its high rate of security and to reduction in the item of depreciation which is high on temporary enterprises. He said that there should be a permanent industrial structure including communities of workers and an increase in the efficiency and stability of common labor, and development of technical skill and economics in manufacturing, lowered costs of production and increase in margin of profit.

Friday Luncheon Talks

Following the morning session, a luncheon was held, presided over by Bonnell Stone, secretary of the association, who introduced President T. G. Woolford for remarks.

Mr. Woolford said the major benefits thus far derived from activities of the association were aiding in building up sentiment favorable to fire control. The future, he believed, held great opportunities for making paper from southern woods, and said that investigations had gone far enough to know that paper can be made from southern trees.

Reporting briefly on the outcome of a trip made to Washington by State Forester Lufburrow and himself to represent Georgia in the allotment of federal aid in forestry relief work, Mr. Woolford said that projects for work were submitted and others later that if accepted would bring to Georgia its share of funds and men to carry on plans of President Roosevelt for relief work on forestry projects in this state. He had learned in Washington that the forestry conservation funds would be available to national forests and parks, to state parks, and to privately owned but organized land areas, in the order mentioned.

Miss Hattie Hardy, secretary of the Chamber of Commerce of Albany, was called upon to speak for the commercial organizations represented. She spoke briefly, expressing keen interest in the association's activities and pledging hearty support of the cause of forestry.

Miss Emily Woodward, Vienna, as a representative of the press, was invited to speak and delighted the audience with her happy remarks of assurance that the press of the state was heartily supporting the cause of forestry.

Educational Program

The afternoon session was given over to educational work conducted by the state forest service. State Forester B. M. Lufburrow presided. The first speaker, C. A. Whittle, Educational Manager of the state Division of Forestry, discussed "Objective of the Educational Program of the Division of Forestry".

In general, he said that the purpose of the educational work of the Division of Forestry is to reach the people of Georgia with information as to how to make the most of their forest resources.

The greatest medium was the press, in which gratifying cooperation has been received both in the news and the editorial columns of the newspapers of the state. He told of the service rendered by the monthly publication, the Forestry-Geological Review, and of numerous reprints made therefrom in the press of the state.

The division found bulletins, leaflets and posters in great demand. Fifteen bulletins, four biennial reports, 16 leaflets and numerous placards have been issued by the Division of Forestry. The moving picture has been widely used in schools, particularly

emphasize the necessity for forest fire protection.

Radio broadcasting, he stated, was used at a number of stations in Georgia with good results.

The work with 120 vocational agricultural schools in Georgia in which school forests are used for teaching the principles of forestry by practice along lines planned by the forest service has been carried on very successfully and the cooperation of vocational heads and teachers, he said, had been very gratifying.

The vocational forestry camp for 100 high school students, held each summer, he stated, was proving a great incentive to interest in Georgia.

Good results, it was stated, were already manifest in the school communities where fire protection, planting and improvement thinning are the direct result.

M. D. Mobley Approved Forestry Work in Schools

M. D. Mobley, Tifton, assistant director of vocational agricultural schools of Georgia, was introduced as the next speaker to discuss the subject of "Forestry Education in Vocational Agricultural Schools."

Mr. Mobley said that "as a result of the cooperative effort of the Georgia Forest Service and the Division of Vocational Education, we have here in Georgia possibly the most unique and practical method of teaching forestry now in operation in the United States. Georgia was the first state to launch such a program. At present, however, a number of states have adopted the 'Georgia plan' or have developed a very similar program."

Mr. Mobley said approximately 150 communities in the state are carrying on forestry education in their schools, that more than 2,500 acres of school forests are used as laboratory tracts for teaching correct forestry management, and a large number of students are carrying on home projects on their father's lands where they are practicing the teachings of the schools.

Mr. Mobley praised the vocational forestry camp as a means of stimulating interest and for training neighborhood leaders in forestry.

In concluding, Mr. Mobley said that the legislature might appropriate millions for experimenting with Georgia pines, but unless the next generation is taught the value of forest resources and how to plan, protect and grow trees, all appropriations will have been in vain.

"How Forestry has Stimulated Interest in Vocational Educational Work" was the subject of an informative paper by R. D. Pulliam, vocational teacher at Soperton. Mr. Pulliam won the Herty prize in 1932 for leading his school to do the best work in forestry. He said that management of forests is an important part of any well rounded course in vocational agricultural teaching, and the teaching of the principles of forestry is quite as essential as teaching crop production. He gave an account of the reaction of his school upon the community in matters of forestry. The influence had been definite in promoting forest protection from fires, in reforestation and better forest management. Students' home projects in forestry had attracted neighborhood interest and led to other practices. The school forest with its cabin constructed by students had attracted favorable attention and stimulated public interest in the objectives of the boys.

The forestry project in vocational schools, he said, had proven popular among students, and the aid rendered by visiting district foresters had been an important factor in stimulating interest. Vocational

teachers in general, he said, had enjoyed the presentation of the forestry subject.

Eugene Adams of the Moultrie High School spoke on "How Forestry Appeals to the Vocational Agricultural Student". His well prepared talk was well received. He spoke of the main reason why high school students should be interested in forestry, of the great natural resources represented by forests and forest products, of the necessity of knowing the principles of forestry so that this great natural resource can be developed intelligently and profitably.

He said that the study of forestry naturally appeals to the high school student, that no course of study was more popular and that home projects in forestry were undertaken with enthusiasm. He felt that the vocational agricultural students of the state were very grateful to the vocational and forestry departments for the opportunity created in Georgia for high school students to study forestry.

About 80 vocational agricultural students were present from various parts of Georgia to attend the afternoon session, some of them making long and arduous trips to attend.

At the conclusion of the program the audience visited the pulp and paper laboratory and was shown how white newsprint, starting in as a pine log, is carried through various processes to make beautiful white newsprint. The visitors were impressed and delighted with the demonstration.

Annual Banquet

The annual banquet of the association was held at Bannon's lodge with President T. G. Woolford, toastmaster. After a delightful menu, Mr. Woolford invited Dr. Charles H. Herty to address the meeting.

Dr. Herty said that while much had been done and progress made in experiments with southern pines for pulp and paper making, only a start had been made. "We have completely refuted every misconception about the use of sap pine for pulp making," he said. He included the misconception that paper made of pine would be too yellow, but he added that the job was not complete. So far, all the experiments of the pulp and paper laboratory at Savannah had been directed to the production of white newsprint, but from now on, he said, more attention must be given to the surfacing of the paper to make it suitable to taking ink and photographic reproductions, and to take out of the paper the crackle it now has when handled.

Dr. Herty pointed out the necessity of research to develop other than newspaper uses of southern woods such as paper napkins, writing paper, book and magazine paper and cellulose products.

Jack Williams, editor of the Waycross Journal-Herald, spoke briefly of the possibilities of forestry in the Waycross region, of the necessity of exploiting the great natural wonders of the Okefenokee swamp and how the south should capitalize on its paper making possibilities.

State Parks Emphasized

The morning session, Saturday, April 29, presided over by Mrs. M. E. Judd, Dalton, was devoted mainly to a discussion of state parks.

W. T. Anderson, editor Macon Telegraph, Macon, spoke on "A System of Parks for Georgia" in his facile and forceful manner. He said man's original temple was the woods and the forests were consecrated, but in our day they are desecrated. President Roosevelt, he said, had conceived the plan of turning the unemployed to the forests to plant and care for trees that they might be removed from vicious influences and placed at work among the wholesome

surroundings of trees. Thus, he said, a great influence has been put in force to bring the nation back to an appreciation of the value of the woods.

Mr. Anderson told of the great amount of money spent on parks by other states and countries. Kentucky has 14 state parks developed through an expenditure of \$25,000 a year for a number of years, and that for 1933-34 the state had appropriated \$250,000 for carrying on park development.

When Georgia cuts off \$20,000 for paper research, he thought it was not yet ready to measure up to Kentucky in park appropriations. He said Georgia had everything essential for parks except an appreciation of the need and value of parks.

He spoke of existing parks, Indian Springs, Vogel Park and Alexander Stephens Memorial park. He advised Georgians to make greater use of the national park at Andersonville and favored memorials to Ben Hill, Robert Toombs, Crawford Long, Senator Bacon and others, and parks marking historic sites in various points in Georgia. He thought these were opportunities for combining parks and game preserves.

Senator W. H. Key, Monticello, continued the discussion of parks, saying that parks were the expression of a noble and cultured people. Savannah, a city of parks and monuments, he cited as a mother city of Georgia whose example should be followed by other cities. Modern life calls for parks, and good roads afford facilities for reaching them readily. Thousands of automobiles are carrying people along the highways, people in the quest of beauty in the open country but with no place to go.

Mr. Key spoke of the many historic spots that should be made accessible and attractive so that the people not only of Georgia, but visitors to the state may regard them as worthy shrines. Other states, he said, had found state parks not only a necessity but a source of revenue, and Georgia would profit in the same way. He called attention, as an illustration of what would be found through the state, to the mission remains of the south Atlantic coast in Georgia, forts, the Midway community, the homes of signers of the Declaration of Independence. He praised Indian Springs, Vogel and Stephens Memorial parks and their attractions, and expressed the hope that Georgia would some day honor itself with an adequate system of parks.

During the morning session Miss Ruth Rountree, daughter of Hon. Leonard Rountree, Summit, Ga., was heard in several vocal selections accompanied by Mrs. Cleveland Thompson, of Millen. Miss Rountree has appeared in opera in the east as well as in the south, and is recognized as one of the most talented young singers of the south. Her numbers were acclaimed with great applause.

The association went into a business session. C. B. Harman, Atlanta, chairman of the executive committee, reported on activities of the association including work with the legislature by which an amendment in effect of anything previously made was obtained. He asked for continued active and loyal support of members in carrying on the association's program of work.

Officers Re-elected

Col. George Butler, chairman of the nominating committee, reported and the following officers were elected:

T. Guy Woolford, Atlanta, president; Indre Ogden Parsons, Forsyth, first vice president; Jack Williams, Waycross, second vice president; J. Phil Carroll, Athens, third vice president; Joseph A. McCord, Sr., Atlanta, treasurer, and Bunnell Stone, Oxford, secretary.

The following is the personnel of the new executive board, all of whom but Messrs. Candler and Lee, were re-elected: Mrs. M. E. Judd, Dalton; Gordon E. Reynolds, Albany; H. L. Kayton, Savannah; Alex K. Sessoms, Cogdell; Thomas Candler, Blairsville; B. C. Milner, Atlanta; J. M. Mallory, Savannah; J. W. Fowler, Soperton; R. E. Benedict, Brunswick; Thomas J. Hamilton, Augusta; W. H. Key, Monticello; Col. E. George Butler, Savannah; W. T. Anderson, Macon; Miss Emily Woodward, Vienna; Dr. W. G. Lee, Macon, and R. E. Price, Kingsland.

J. M. Mallory, chairman of the committee on place of annual meeting, named Augusta. After spirited remarks from the representatives of other cities seeking the meeting, Augusta was selected.

Senator W. H. Key, Monticello, chairman of the resolution committee, offered resolutions of cordial appreciation of the hospitality of Savannah and thanking the press, the Savannah Hotel, President T. G. Woolford, the Savannah Industrial Committee, State Forester B. M. Lufburrow and Hon. S. H. Morgan, Guyton, who provided flowers for the convention.

Resolutions approved President Roosevelt's reforestation plan, favored continuation of appropriations under the Clarke-McNary Act for forest fire prevention and advocated a system of state parks.

Gratification was expressed at the progress of experimentation in the pulp and paper laboratory of the Department of Forestry and Geological Development in charge of Dr. Charles H. Herty.

Cooperation was offered by the association to chambers of commerce and similar commercial organizations in Georgia in their efforts to get paper mills in Georgia.

Gordon Reynolds, Albany, introduced a resolution from the floor expressing appreciation of the long, faithful and efficient service of Secretary Bonnell Stone, which was adopted.

Paper Makers and Forestry Association in Joint Session

Representatives of the American Pulp and Paper Manufacturers Association and similar organizations of technical paper manufacturers came to Savannah, 75 in number, at the invitation of the Georgia Forestry Association to study the results of the state pulp and paper laboratory at Savannah and view the forest resources of pulpwood in that section. The northern visitors arrived by boat Monday, May 1, were taken to the DeSoto Hotel, where a joint session of paper makers and forestry workers of Georgia was held.

The occasion was unusual and quite significant, perhaps an historic event, even marking the turn of paper making southward.

Judge Ogden Persons, Forsyth, vice president of the Georgia Forestry Association, welcomed the visitors in an eloquent address in which he gave a graphic sketch of the historic setting in which the visitors found themselves welcome guests, and hoped that they would feel no restraint in indulging the hospitality of Georgia to the limit.

Speaking of the objectives of the meeting of paper makers and forest growers, he said that frankly, Georgia believed that Dr. Herty had demonstrated a possibility of making newsprint from southern pines, that Georgia had 23,750,000 acres of forest land, the greatest forest area of any state in the union, occupied largely by species of trees shown to be suited to paper making.

He read an editorial from the Manufacturers Record showing that paper making

in the south had made greater progress in recent years than anywhere else in the nation—this in the production of kraft paper. Now with Dr. Herty's discoveries of the possibilities of making newsprint from young southern pines and with sulphur, clay and rosin at hand, with well established transportation facilities, nearness to the great consuming market, all the year accessibility to supplies of pulpwood at low cost, rate of tree growth that makes possible the production of a crop of timber suited to paper making in seven to ten years, he believed there was nowhere greater advantages for paper making to be found than here in the south. The state of Georgia, he said, welcomed paper manufacturers of the north to follow the lead of the New England textile mills to the fields of supply, and to feel sure of a cordial welcome and fair treatment in Georgia.

Laboratory Results Given

W. G. MacNaughton, assistant research chemist of the state Pulp and Paper Laboratory, formerly with the International Paper Company, and formerly an officer of the American Pulp and Paper Company, next presented a paper dealing with the subject "Georgia Pine Sulphite and Ground Wood for Newsprint", and reported findings of the state laboratory.

He reported the early work of Dr. Herty who conceived the possibilities of using young southern pines for making white paper; had chemical analyses made to show that young pines did not contain too much resin as was generally thought to hinder the making of white paper, and how the state of Georgia had been led to make an appropriation, the American Chemical Foundation, the city of Savannah and private citizens had donated funds to establish a laboratory at Savannah for carrying on research.

McKee and Cable reported in 1921 experiments with sapwood of pines that gave a pulp with yield and color practically equivalent to the yield and color of sulphite obtained from spruce under nearly identical conditions. The Georgia laboratory had found that the chemical characteristics of sap wood have not presented any problems in the production of sulphite or ground wood pulps.

An outstanding feature of southern pines, he said, was the extreme difference between the density of the spring and summer growth of pines, for spring wood a density of 0.35, for summer wood a density of 0.70. Laboratory records on twelve year old pines showed 30 per cent summerwood and an average density of 0.47. Analysis of loblolly revealed spring wood to contain 58.06 per cent cellulose, 28.12 per cent lignin, while the summer wood has 61.21 per cent cellulose and 26.78 per cent lignin, with total components of the two woods practically the same.

Results of sulphite pulping given by W. F. Allen, laboratory chemist, carried on within commercial limits and various compositions of acid and temperature were reported, one showing satisfactory pulping at a total cooking time of 10 to 11 hours. Tests with dolomite and lime had revealed no identifying condition regarding the kind of lime to use.

Microscopic examination of fibre revealed marked difference in the cell structure of spring and summer wood fibres, magnification revealing spring wood as short pieces of ribbon and summer wood fibre fragments of wire. The spring wood fibre not having necessary cell wall strength collapsed, while the summer wood fibre, with greater strength, did not collapse even after drastic cooking. Hand sheets of paper

made by the laboratory were distributed for inspection.

Economic Advantages

Col. E. George Butler, Savannah, discussed the "Economic Advantages of Georgia for Manufacturing Paper." Col. Butler outlined in brief the contents of his paper which he stated would appear in printed form and be distributed later.

Attention was directed to the vast acreage of rapid growing trees in the state where it is possible to obtain sustained yields in a comparatively short rotation of 7 to 12 years in which period it is possible to grow pines of suitable size for paper manufacture.

The state has 23,750,000 acres classed as timberland, a great part of which is devoted to the growth of pines, and since much of the pine area is now classed as second growth, it is occupied by timber either of suitable size for making paper or is in course of producing pines that in a few years will be available for this purpose.

Col. Butler brought to the attention of the audience the all-year round operating season in the woods, excellent transportation facilities of rail, water and highways penetrating all parts of the state; abundance of water; low cost of dependable labor; supplies of secondary materials such as lime, clay, sulphur, rosin, reasonable electric power and fuel rates; comparatively cheap lands on which a supply of pulpwood can be grown by a paper mill; comparative nearness and easy accessibility to consuming centers of paper.

Paper Official Heard

The closing address of the morning was delivered by Charles W. Boyce, secretary of the American Paper and Pulp Association.

Mr. Boyce drew a distressing picture of the present conditions of the paper manufacturing industry. Like many other industries during the depression, it had found itself over-expanded and engaged in profitless competition. In addition, the paper industry has had to suffer from depreciated foreign currencies that allowed European producers to enter the American market with severe and demoralizing competition.

Mr. Boyce said that Dr. Chas. H. Herty had undertaken in the face of demoralized paper manufacturing conditions to find a way for developing the industry in the south. He complimented Dr. Herty on his faith, vision and service to the paper industry in revealing the possibilities of the south. He said they had come by invitation to study Dr. Herty's findings and take a look at the forest resources of a section of the south.

In developing the paper manufacturing possibilities of the south, he said competition of Canada, the Pacific northwest, Europe and Russia would have to be faced. Taking a 250 mile belt in the north and east as a center of production and consumption of paper, he said that the south was no nearer than Canada with sources of pulpwood, that the northwest with great supplies and large recent production of pulp and low water rates to the east must be considered. Europe with close utilization and economy of production, coupled with depreciated currencies, was making devastating inroads into American markets, while Russia had been and may be again a factor in woodpulp materials.

Mr. Boyce said that the south had made rapid progress in producing kraft paper, revealing economic advantages. Dr. Herty's work had shown the possibilities of making newsprint from young southern pines. The south, with rapid growing species of trees

and long growing season, held exceptional opportunities for sustained yields and a permanent source of a large supply of pulpwood, which, along with other opportunities, revealed to paper manufacturers a potential source of supply whenever in the future the industry may find itself ready to develop these resources.

Mr. Boyce congratulated Dr. Herty and the state for its enterprising forward steps in research to develop the possibilities of paper making in this section.

Georgians Hold Conference

Georgians in the meeting were asked to remain at the close of the meeting for a brief conference. Bonnell Stone, Secretary of the Georgia Forestry Association, called the meeting to order and introduced W. T. Anderson of Macon.

Mr. Anderson said that a number of representatives of Georgia Chamber of Commerce were present and intent upon interesting paper manufacturers to establish plants in their respective communities. He said that a number of the visiting Georgians seemed to be under the impression that Dr. Herty's work had been completed to the point where all the information necessary to assure successful production of newsprint has been developed. This, he said, was contrary to any claim ever made by Dr. Herty, that the necessary research work had hardly more than begun.

Mr. Anderson said that Dr. Herty had been asked to make a statement of the status of his work and what is yet to be done. This statement was read, which showed that while many important and encouraging facts had been developed and paper had been made, it remained to be shown how the paper could be produced with tensile strength suitable to the high tension of more rapid production of large commercial plants and how to perfect the paper surface for ink absorption, cut reproduction, as well as best methods of making book and writing paper in which Georgia clays and osin play a part.

The chief concern of the Chambers of Commerce of the state, he said, should be to find ways of keeping Dr. Herty on the job.

Paper Makers Visit State Laboratory

The visitors from the north were conveyed to the pulp and paper laboratory of the state located at Savannah and were conducted through the plant by Dr. Chas. H. Herty and his staff. Many questions were asked, and informal discussions carried on. Suffice it to say that the paper makers were pleased with the way the research work was being carried on, and impressed with the correctness of the findings.

Banquet Addresses

A banquet tendered at the DeSoto Hotel was largely attended. Judge Ogden Persons, Forsyth, presided in his affable and pleasing manner.

Thomas Gamble, Mayor of Savannah, delivered an impressive address. He told of the work of Dr. Herty in revolutionizing turpentine practices of the south in spite of the incredulity of the operators and how in his undertaking to make white paper from southern pines he faced the same incredulity. Nothing daunted, Dr. Herty had gone forward, dispelled misconceptions, and had built up convincing evidence.

Mayor Gamble grew eloquent in his description of the southern pine, its rapid growth, its varied uses, its luxuriance, and how visitors would see trees only seven years old big enough to make pulpwood. The pines reseed abundantly with no cost for planting on the greater part of the state's lands. A vast acreage in the state

once cultivated, should be devoted to growing trees and, in fact, would grow nothing so profitably as pines.

In closing, he said, "We have come to a full realization of the fact that our future prosperity lies in the devotion of our potential forestry land to forest growth."

Allen Abrams, president of the Technical Association of Pulp and Paper Institute and Chemist of the American Paper Mills of Wisconsin, spoke in an illuminating manner about the economic phases of paper making and of the necessity of being fortified properly before rather than falling headlong into a development unless it can be a secure one.

Mr. Abrams said, "The possibility of establishing a sulphite or white paper industry in the south is an intriguing one and naturally of vital interest to you as well as to the rest of us. The first, or technical phase, is well under way under the direction of that able chemist, game fighter and good fellow, Dr. Charles Herty."

"It is Dr. Herty who ferreted out the facts of paper making interest—that your southern pines develop heartwood only after twenty years of age; that the rosin content is low until heartwood develops; and that a paper making stand of timber can be grown in from ten to fifteen years. It is he who has asked the papermen of the country to take his facts and tell him what is wrong—and that is the right attitude for a man to take, be he scientist, banker or what not.

"But as in all research of such a character it is impossible to give a sound answer in a short time. I thought Judge Persons took a commendable attitude this morning when he expressed the idea that sound development in five to ten years would be satisfactory."

He considers that Georgia has the streams necessary for proper water supply; a mild climate, low building costs, limestone, coal, clay, rosin and alum, sulphur conveniently near, cheap and dependable labor, and good shipping facilities.

He said to Georgians: "Have a thorough and impartial analysis made so you will know exactly what you must do if you wish to succeed. Progress cannot be stopped, and I want to assure you it is our earnest hope to keep in close touch with you and to help steer this work along for our mutual interests."

R. G. McDonald, secretary of Tappi; Georgia Butler and Dr. Charles Herty were introduced and made brief statements.

Field Trip of Paper Men

May 2 was given over to a field trip, first to Hinesville in Liberty county, where a fish dinner was served. Mayor J. B. Frazier welcomed the visitors.

Dr. Chas. H. Herty introduced James A. Fowler, Soperton, who spoke on his experience in planting pines. Mr. Fowler has been planting pines for seven years over a large acreage. He told of their rapid growth and how he had supplied the state pulp and paper laboratory with some of the thinnings of 7-year old pines for making paper and how an issue of his home paper had been printed on this paper.

Mr. Fowler advocated planting a vast acreage of state lands that will not restock satisfactorily by natural reproduction, his experience showing that a more satisfactory stand can thus be obtained, more rapid growth secured and earlier yields of pulp and naval stores than waiting for natural reproduction.

Mr. Fowler has the distinction of being the first to grow pines that in seven years had produced trees 5 to 8 inches in diameter that were converted into paper.

Alex K. Sessoms, Cogdell, a large timber owner, spoke on natural reproduction. He told of the plans followed on his large holdings for fire prevention and how immediate reproduction came about. The problem of getting a stand of pines over much of the south could be completely solved by merely keeping out forest fires.

So generous were the pines in seeding, and so well equipped were they for scattering their winged seed that very thick stocking resulted, presenting a problem of thinning. He hoped paper mills would solve the problem by creating a market for thinnings.

The party took up its itinerary after the Hinesville program, visiting the Howard-Parker area where a splendid demonstration of the natural reproduction discussed by Mr. Sessoms, was found demonstrated.

A sawmill at Townsend was inspected and then a visit was made to the Gillican-Chipley turpentine still where a run was in progress. The process attracted much interest. Some negroes entertained with music and dancing, and workers in the stove factory demonstrated how they could synopate their work so as to play a tune on the staves.

The party returned by Midway, inspected the old church and historic cemetery, and then returned to Savannah where the visitors took boat for home in the evening.

BROADCASTING STATION ON FORESTER'S BACK

A new portable radio set so light and durable that it can readily be carried in the back-pack of a forest worker is undergoing final tests by the Forest Service. It weighs only 13 pounds and will transmit as well as receive voice messages, reports the United States Department of Agriculture.

Last year, the Forest Service put into actual field use in a number of western forests two types of radio sets developed by Forest Service officers. One of these, a 56-pound semiportable set, was designed to receive and transmit both voice and code. The other was a portable set, weighing 11 pounds, which received voice but transmitted code only.

The new 13-pound set, as designed by forest officers, is expected to duplicate the performance of the 56-pound semiportable set. The advantages of voice communication with a portable apparatus are obvious. The new set uses short wave lengths and special new-type tubes, and should be capable of maintaining communication throughout an entire national forest. It will be especially valuable in areas where there are no telephone lines or highways.

In some cases forest supervisors are planning to use radio to supplant telephone line extensions, now costly to maintain over snow fields and glaciers. The semi-portable and code radio sets used last year proved decidedly advantageous in maintaining communication in broken mountain and canyon regions and in keeping in close touch with crews and "smoke-chasers", fighting forest fires in the North Pacific and Northern Rocky Mountain regions.

GEORGIA CONSERVATION CAMP SITES LOCATED

State Forest Service has Selected 30 Camp Sites Aside from National Forests on State and Organized Privately Owned Lands — Four Sites Approved First

The State Forest Service, which is authorized to carry on conservation relief work in the state outside of the national forests, has submitted 30 projects, four of which have already been approved. These are Indian Springs, Hinesville, Waycross and Albany. These four 200-men camps were selected by representatives of the state forest service and officers of the army this week, and an assignment of men to set up these camps is expected in a week or ten days, to be followed by a full quota a short time thereafter.

In selecting camp sites, State Forester B. M. Lufburrow stated at a banquet tendered Friday night, May 19, to T. G. Woolford, president of the Georgia Forestry Association, that the relief Act of Congress permits work on state lands and on private lands where private land owners have been carrying on fire control work under cooperative agreement with state and federal agencies. He stated that on state owned lands projects have been submitted taking care of Indian Springs, Alexander Stephens Memorial at Crawfordville, Vogel Park at Neel Gap, state forest at Augusta, state properties in Baldwin and Tignall counties, and state nurseries at Albany and Blairsville.

According to Mr. Lufburrow, the first camps on lands of cooperating land owners are located at most convenient centers, but after six or more months some of the camps may be shifted to other sites.

The proposed camp sites on lands of protective organizations, selected for approval of the U. S. Forest Service, are as follows: Hinesville, Albany, Blairsville, Ellijay, Habersham county, Walker-Chatooga county unit, Alpharetta, Jackson county, Hart county, Warm Springs, Burke county, Taylor-Talbot county unit, Quitman-Randolph-Clay-Seminole unit, Turner-Worth-Tift unit, Echols county, Clinch county Brantley-Carlton unit, Camden county, south Carlton unit, Brantley-Wayne-Glynn unit, Long county, Chatham county, Screven county, Bulloch county, Montgomery county, Jeff Davis-Coffee-Bacon-Appling unit, Treutlen county, Emanuel county, Laurens-Wheeler-Telfair-Dodge unit, central Dodge county, south Telfair county.

In all, work is contemplated in 69 counties of Georgia.

The telegraph companies, enjoying war time business, as the 250,000 workers are mobilized, might order a billion new poles with the money they make out of this forestry push.

T. G. WOOLFORD HONORED BY FRIENDS WITH DINNER

On the night of May 19, a number of forestry friends of Georgia assembled at the Ansley Hotel in Atlanta and tendered a complimentary dinner to Mr. and Mrs. T. G. Woolford as an expression of appreciation of Mr. Woolford's service to forestry in Georgia, and to honor him for his recent election as a member of the directorate of the United States Chamber of Commerce.

Gordon Reynolds, Albany, was toastmaster. Those speaking their sincere appreciation of Mr. Woolford's services and felicitations to Mrs. Woolford, were C. B. Harman, Atlanta; Bonnell Stone, Oxford; Mrs. M. E. Judd, Dalton; Judge Ogden Persons, Forsyth; Miss Emily Woodward, Vienna; B. M. Lufburrow, Atlanta; C. C. Kuehn, Woodbine; C. A. Whittle, Atlanta; E. S. Center, Jr., College Park; James A. Fowler, Soperton; E. George Butler, Savannah; S. W. McCallie, Atlanta.

Others in attendance were Mrs. Gordon Reynolds, Albany; Mrs. Bonnell Stone, Oxford; Mrs. B. M. Lufburrow, Mrs. Dixon and Mrs. S. W. McCallie, Atlanta.

Telegrams and letters from a number of people active in forestry in the state were received expressing appreciation, and regret of their inability to be present.

A handsome basket of flowers from Mrs. Judd's gardens, and books of poems from Mrs. Judd's library were presented.

Mr. and Mrs. Woolford expressed sincere appreciation for the surprise party.

Reforestation, conservation, perspiration, blisteration, chiggeration, army ration, reflation of the nation.

Sap's in the trees and saps in the woods, but little forestry sapience available in these happy days that are here (and there) again.

Trained foresters a plenty were among the "forgotten men" till this reforestation relief began, and now as rare birds they are noticed and run after as much as the Prince of Wales.

Whether it is a firebreak, fire line or fire trail, here is a vociferous vote for "fire break".

Bonnell Stone Speaks

Bonnell Stone, Oxford, was a guest speaker of the Kiwanis club of Covington, and told of the progress of forestry and the possibilities of farm forestry in that section of the state.

E. L. Demmon, director of the Southern Forestry Experiment Station, New Orleans, was a visitor in the state forester's office in May.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

Woodville T. P. O., Green County, Planned

Plans are under way for the organization of a 20,000 acre timber protective organization near Woodville in Green county. A committee of local citizens appointed to investigate and report on the acreage to be enlisted, the assessments to be made, and the program of work to be carried out is: R. R. Shaw, chairman; A. S. Durham and J. L. Wilson. A meeting to complete the organization will be held during the latter part of May.

Patrolman Moore's Brier Creek T. P. O.

Patrolman T. M. Moore of the Brier Creek T. P. O. in Burke county has an excellent fire record for the first three months of 1933. Of the 25,000 acres of land under his supervision, only 165 acres, or approximately 1-15 of 1 per cent of the land under protection, was burned over.

Mr. Moore is to be complimented on this excellent record.

Biologists Visit Augusta

Dr. A. H. Howell and Mr. T. D. Burleigh, Lenoir, associate biologist of the U. S. Biological Survey, recently made Augusta their first stop in a tour of Georgia to obtain data on the birds and animals of this state. Range, distribution and food habits of the mammals are to be studied. The biologists expected the trip to be of some six weeks' duration.

FOURTH DISTRICT

W. G. Wallace, Dist. Forester
Columbus

Meriwether T. P. O. Has Good Record

The Meriwether Timber Protective Organization at Warm Springs has an excellent fire protection record for this year. Since January 1, only two fires broke out and were confined to 5 acres. These two fires were started accidentally, probably by smokers. No fires resulted from debris burning which generally causes most fires in this section during the winter and spring.

Hoke Smith, fire chief of the timber protective organization and his crew are quick to respond to fire calls and are willing fighters, using the excellent equipment to good effect.

The activities of the fire fighting crew are not limited to T. P. O. lands, but assistance is given to adjoining land owners.

The district forester has made numerous contacts in and around the organized area and finds a high degree of sentiment

against woods burning, developed since the T. P. O. was organized, in contrast to an indifference to forest fires and in some cases a belief in woods burning that existed previously.

Hogansville High Represented at Savannah

Under the leadership of Prof. Claud Bray, vocational agricultural teacher at Hogansville High School, five students interested in forestry work of the school, attended the annual meeting of the Georgia Forestry Association at Savannah and found it a most enjoyable and instructive trip.

Georgia Industrial College Splendid Work In Forestry Ended

It is very regrettable that the splendid work in forestry carried on by the Georgia Industrial College at Barnesville under the leadership of Prof. F. W. White is ended by reason of the discontinuance of the institution of the Board of Regents of the University. This institution had not only won highest recognition for work in vocational forestry, but the school had developed a large tree nursery of very high class, erected a forestry cabin, organized a vocational forestry club and had managed a large forestry tract in the most approved manner.

From a forestry viewpoint, the discontinuance of this school is a distinct loss.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Dodge T. P. O. has New Members

The timber protective organization in Dodge county has increased in acreage from 10,500 to 18,000 during the past quarter, ten new members having been added to the list.

The new members plan to plow firebreaks, buy fire pumps and be prepared for fire when the time comes. The Dodge T. P. O. has been very successful in that it has had few fires during the past two seasons and the more members that can be listed in the organization, the fewer fires they will have. Mr. Hillis, secretary-treasurer of the organization, states that more interest is being shown in the work than ever before.

Camp Site in Liberty Inspected

Lieutenants Jenkins and Tipton of Fort Benning inspected the proposed site for a camp in Liberty county, which, if approved, will be the home of some 200 men for the next twelve months. The army men were well pleased with the site and reported favorably on it.

If the camp is approved, the men will begin work there as soon as the preliminary work of establishing camp has been finished. The work plans call for primary firebreak construction on lands which are under cooperative agreement for protection under state suppression.

SEVENTH DISTRICT C. Bernard Beale, Dist. Forester Waycross

Star Naval Stores Company Protecting

The Star Naval Stores Company, Thelma Naval Stores Company, and the Groveland Naval Stores Company, representing interests of Chas. Gillican and others of Homerville in Clinch county, embracing 47,000 acres, is a recent addition of acreage active in fire protection in the Consolidated Timber Protective Organization of Homerville.

Firebreaks with the Hester plow are now being plowed on these lands and it is understood several hundred miles are planned.

This is a welcome addition to the Consolidated Timber Protective Organization and the organization will be greatly strengthened by having these lands join in.

Timber Protective Organizations Have Good Fire Record for Season

This has been as good a fire season as last year was bad for the timber protective organizations. All the timber protective organizations in this district got through the fire season with exceptionally low records of fires, most of the fires on organization lands being on member lands who have stopped protection work and gone into burning. It is expected that many of these members will see the error of giving up fire protection, see the good records of the timber protective organizations that have kept up their firebreaks and fire fighting, and that many will come back into the fold next year and resume the protection work. This is to be hoped for.

Appleby Lands Inspected

Inspection of 8,000 acres of timberlands owned by Scott B. Appleby of Augusta and located in Jeff Davis, Coffee and Brantley counties in this district, has been made by the district forester and plans prepared for the protection and development of these properties.

This acreage will probably be placed in the timber protective organizations of the several counties for fire protection cooperation.

County Suffers Short Drought

The Waycross section has suffered from a several weeks' drought. The ponds, bays and crawfish lands had dried up and the recent rains are certainly welcome. Many land owners will have the fire danger worry removed from their minds now that things are getting wet again.

EIGHTH DISTRICT H. D. Story, Jr., Dist. Forester Albany

Progress of State Nursery

With the emergency conservation force ready for forestry work, a large demand

for planting stock is expected next year. Though the reforestation idea as an emergency measure did not take root till late in the seeding season, several new seed beds were rushed to completion for late planting.

Nurseryman Bauer reports that in spite of bad weather and insufficient shade, a larger percentage of the seeds have produced seedlings than last year and present prospects favor a much larger crop. He hopes to sell at least a million seedlings.

An excellent stand of black walnut has been obtained this season.

The sulphate of ammonia tests carried on last year are continued this year. The first year's results are promising, giving stockier, greener and better rooted seedlings.

Advice to Enlisted Forest Workers

Pine gum is not for chewing purposes—unless you should happen to like it.

The acorn, not "corn" is generally native to the forest.

A machete is designed to cut saplings in this country, and not yourself or your neighbor.

Get acquainted with the poison ivy before it gets familiar with you.

A good cure for sore muscles is more work.

A firebreak is a non-combustible streak made by back-breaking labor.

A fire tower is erected for fire spotters who are not supposed to go to sleep on the job.

The rail splitter is extinct. That avenue to the presidency is closed.

A "dull axe" is your best alibi.

A forest lover is born, not made, in a six month's forest work camp.

"God alone can make a tree" and your duties do not include giving Satan a hand in it.

T. G. WOOLFORD DIRECTOR U. S. CHAMBER OF COMMERCE

At its annual meeting early in May, the United States Chamber of Commerce elected T. G. Woolford, Atlanta, president of the Georgia Forestry Association, as director of that organization.

The honor came as a recognition of his outstanding business ability, knowledge of southern conditions and ability for national leadership in directing the most important organization of business men in the world, the United States Chamber of Commerce.

The many friends of Mr. Woolford are gratified at this recognition of a great business leader.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

WATER POWER OF GEORGIA

It has been computed by B. M. Hall and M. R. Hall and recorded in Bulletin 38 of the Georgia Geological Survey, that 2,381,800 10-hour horse power is available from Georgia streams. According to the annual report of State Geologist S. W. McCallie the amount of horse power of Georgia streams developed in 1931 was 423,300.

Seven main watersheds of Georgia and their potential water power are as follows:

Savannah river basin	734,050
Ogeechee river basin	9,300
Altamaha river basin	251,550
Coastal region basin	40,500
Apalachicola river basin	935,300
Mobile river basin	
in Georgia	297,000
Tennessee river basin	
in Georgia	114,100

These estimates are made on "safe average daily output in 10-hour horse power" but estimated on a low water average, the horse power is placed at 1,743,650.

Savannah River Basin

Development of water power in Georgia has occurred largely since 1903. Previous to that time the only water power development of consequence in this state was that represented by the Augusta canal, for a long time the most extensive water power development in the southern states. Construction of this seven miles of canal was launched in 1845 by a private company. The City of Augusta acquired it in 1849. Its capacity has been increased from time to time and with average year water flow has a net capacity of 15,700 net horse power under a 40-foot head, continuously 24 hours a day, or with daily storage, 37,600 horse power, ten hours per day.

Other developments on the Savannah river basin are Stevens creek plant on the Savannah river with 31,250 horse power, with plans calling for double this capacity.

Elberton Light and Water Power Company, 360 horse power; Gregg Shoals at the mouth of Cold Water Creek, 1,520 horse power; Tallulah Falls, 108,000 horse power; Burton 9,000 horse power; Nacoochee 7,500 horse power; Terrors tunnel 20,000 horse power; Tugalo 88,000 horse power; Yonah 37,500 horse power.

Chattahoochee River Basin

In the Chattahoochee river basin the following water power developments have been made: Dunlap, near Gainesville, 3,000 horse power; Bull Sluice, near Atlanta, 16,-

800 horse power; New Bridge on Chestatee river near Gainesville, 1,500 horse power; Habersham Mills on Soque river, 1,050 horse power; Chestatee Pyrites and Chemical Co., on Chestatee river, 16,800 horse power; Roswell Manufacturing Co., 400 horse power; West Point Manufacturing Co., 4,600 horse power; Columbus Power Co., 36,376 horse power; City Mills Power Co. (Columbus), 600 horse power; Eagle & Phoenix Mills (Columbus), 5,900 horse power.

Oconee River Developments

Mitchell bridge, 1,025 horse power; Talahassee shoals 1,300 horse power; Barnett shoals 5,600 horse power. These three dams are near Athens. Oconee River Mills, Milledgeville, 500 horse power. The Georgia Power Company has a large incomplete development at Milledgeville. Other developments in the Altamaha basin are Porterdale near Covington on the Yellow river, 1,400 horse power; Towaligo Falls in Monroe county, 5,000 horse power.

Lower Apalachicola Basin

The following developments occur in the Apalachicola basin of southwest Georgia; Bainbridge Power Company on Spring creek; 1,200 horse power; Cordele Power Company, 5,000 horse power; Georgia-Alabama Power Company, Albany, 10,800 horse power; same company on Pataula creek, 2,500 horse power.

Other Developments

The Jackson Dam near Jackson in Butts county on the Ocmulgee river of the Altamaha basin has 33,000 horse power.

On the Etowah river of the Mobile river basin, near Cartersville, a plant with 411 horse power has been developed.

On the Toccoa river near Blue Ridge 26,810 horse power has been the latest important water power development on the streams of Georgia.

Many minor water power developments mainly for operating flour mills have taken place since the first settlement of Georgia, of which there are no records to show their total horse power.

Future Developments

The actual development of water power compared to the possible development shows that Georgia has hardly started. Further progress awaits a demand. This demand will be created mainly by increased manufacturing, though as the pop-

ulation of the state increases and cities grow, lighting and heat will provide a new demand. At present water power utilization is quite up to the state's needs.

Take the Chattahoochee river as an example. The United States States Engineer Corps have made surveys, borings and estimates for a series of dams from Columbus to Atlanta, each to back water up to the foot of the next dam and provide navigation. Supplementing this, B. M. Hall computed water power from Atlanta to Gainesville. It was disclosed that the fall of the river from Gainesville to Columbus is 795 feet for the 205 miles of the stream flow. Only 225 feet of this fall has been developed, leaving 570 feet unutilized. Nine new dams would be required in addition to the seven dams in existence.

Water Flow and Horse Power

The term "horse power" means a power sufficient to lift a weight of 33,000 pounds at the rate of one foot a minute. In terms of water power it means the amount of power developed by 550 pounds of water falling one foot per second. "Net horse power" is a term usually applied to the output of the water wheels. This is usually assumed to be 80 per cent of the theoretical amount.

The term "10-horse power" has become a common measure of commercial horse power, which means a specified amount of horse power for a period of 10 hours per day. Charges for power at a yearly rate of horse power are usually based on 10-hour power.

Sales of electric power are made by "kilowatt" equal to 1.34 horse power. The term "kilowatt hour" means one kilowatt for a period of one hour.

DIVISION OF GEOLOGY'S EXHIBIT AT CHICAGO

The Georgia Commission of Chicago Exposition sought an exhibit of mineral resources of Georgia displayed in the State Museum in the State Capitol.

State Geologist S. W. McCallie was authorized by the Commission of Forestry and Geological Development to use the exhibit material and plans were made with the exposition commission to use a portion of the Georgia space at the Chicago Fair for the display of some of the minerals of the greatest commercial importance.

Those who visit the Chicago World Exposition will find the Georgia mineral exhibit highly informative and interesting.

N. L. WILLETT DEAD

N. L. Willett, Augusta, Ga., age 82, died at Warrenton, Va., on May 14. In his death the state of Georgia has lost a friend of the cause of forestry and one who, as a writer for the Augusta Chronicle, has done much to promote an appreciation of the state's forestry resources.

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VOCATIONAL FORESTRY CAMP JULY 24 TO AUGUST 12

Third Camp for Students of Rural Consolidated High Schools Conducted Cooperatively by State Forest Service and State Department of Vocational Teaching

The third annual vocational forestry camp will be held at the A. and M. school at Clarkesville, Ga., July 24 to August 12. The state forest service and the department of vocational teaching of Georgia join in conducting the camp. About 125 will be in attendance, of which 100 will be students and the remainder instructors and families.

A course of practical forestry will be given in which tree identification, forest management, surveying, timber cruising, harvesting, marketing and tree nursery practices will be taught.

About half of the students will attend the camp for the second year and if they successfully complete the course, they will receive a certificate of Vocational Forester which will recommend them for non-technical forestry jobs.

Those privileged to attend camp have won scholarships in competitive examinations in forestry in their counties and are recommended by their teachers as having high general scholarship in school and excellent moral character. The personnel of the forest body is, therefore, of a high order.

The two preceding camps have been so interesting and enjoyable that camp scholarships are keenly sought by students in all the schools having vocational teaching. The instruction and inspiration received have made of the students enthusiastic missionaries for forestry in their home communities.

The camp program not only includes intensive work on forestry subjects, but embraces moving pictures, lectures, entertainment of various kinds, athletic contests, hikes and trips by cars to various points of forest and scenic value.

If you ask the enlisted forest workers, intensive forestry is being practiced in Georgia.

GEORGIA FORESTRY ASS'N EXECUTIVE COMMITTEE MEETS

An annual event looked forward to with pleasure is the summer meeting of the Executive Committee of the Georgia Forestry Association, held at Indian Springs with Judge Ogden Persons, Forsyth, as host. On June 16 the executive committee met at the historic park, a number of those in attendance taking their wives at Judge Person's request.

The sessions of the executive committee were highly interesting and plans were made for various lines of activity for the year. President T. G. Woolford, Atlanta, presided. A delightful dinner was served at the Elder House, and Judge Persons was cordially thanked for his generous hospitality as host.

Those attending the meeting were: President T. G. Woolford, Atlanta; Judge Ogden Persons and Miss Mary Persons, Forsyth; C. B. Harman, Atlanta; Mrs. M. E. Judd, Dalton; Mr. and Mrs. W. T. Anderson, Macon; James Fowler, Soperton; Col. George Butler, J. M. Mallory and Dr. Chas. H. Herty, Savannah; Mr. and Mrs. Bonnell Stone, Oxford; Miss Emily Woodward, Vienna; Mr. and Mrs. B. M. Lufburrow, Joseph McCord, Atlanta; Mr. and Mrs. Edgar Center, Jr., College Park; Roland Turner, Atlanta; Dr. and Mrs. W. G. Lee, Macon.

PROBLEM OF PRIVATELY OWNED FOREST LANDS

In "A National Plan for American Forestry," known otherwise as the "Copeland Report," which discusses under "Major Forest Problems" the problem of privately owned forest lands, we find the following declarations:

It is the most important type of ownership.

It is largely responsible for forest devastation and deterioration.

It is the most unstable form of forest-land ownership.

It is responsible for serious economic difficulties in the forest industries.

It is responsible for serious economic and social losses to the public.

It has fallen far behind public ownership in management and administration.

WHAT CONSERVATION WORKERS ARE DOING

Thirty-five Camps for Georgia, Thirty under State, Five under National Direction — Two Hundred or More in Each Camp—Work Getting under Way

About 7,000 men are soon to be engaged in forestry work in Georgia carrying on this phase of the Roosevelt relief program. Thirty-five camps of about 200 men each are authorized for this state, of which thirty are under the direction of the state forest service on state and private lands and five under the direction of the United States Forest Service on National forests in the mountains of North Georgia.

The five national forest camps were the first to be authorized and therefore were the first to get under way. The first three camps authorized for the state forest service were immediately set to work in early June at Hinesville, Homerville and Albany, in South Georgia.

Authorization for the remaining twenty-six camps was received the first week in June to do work on projects submitted by State Forester B. M. Lufburrow. A meeting of district foresters was held and men were chosen as camp supervisors, technical foresters, bosses, mechanics, etc. Purchases of work equipment were made and transportation facilities provided. A vast amount of detail work was necessary in the very short time required to absorb the enlisted men moving to camp sites from various army posts where they had received preliminary conditioning. The forestry force of the State has met the situation under high pressure activity and excellent planning.

The question most generally asked is "What kind of work are the men doing?"

In answer, most of the work in Georgia is done on organized, privately owned lands. Georgia has a number of timber protective organizations, some of which have been in existence six to eight years, which have been cooperating with state and federal forest agencies in carrying out fire protection measures. It is mainly on areas controlled by these organizations that the conservation corps men are to be employed.

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K. S. Trowbridge,.....Tifton

(Continued from Page 1)

It is permissible under the act of Congress authorizing this activity to work not only on the areas that were organized at the time the Act became effective, but on contiguous areas added to these timber protective organizations. This has resulted in a rapid expansion of the area under organized protection until at the present time it is about twice as large as it was before. At the time this is written the organized area has attained over 4,000,000 acres.

The work to be done on organized timber lands consists mainly in establishing community wide or county wide forest fire protection. Continuous primary firebreaks are to be established and lookout towers and telephone lines are constructed for this purpose. A primary firebreak consists of a strip 25 feet wide, or wider, from which all combustible material is removed and then plowed. Dead snags alongside the firebreak that may burn, and under high wind provide sparks that would leap the firebreak, are removed.

Fire lookout towers built of wood or steel will serve for spotting fires over a radius of several miles during the fire sea-

son and the telephone lines radiating from the tower site will be the means of assembling a fire fighting crew so that it may suppress the fire before it makes much headway.

The private land owners benefited by this work have obligated themselves to maintain the primary firebreaks by plowing them once a year, man the fire towers keep up the telephone lines, and to construct secondary firebreaks to make the protective measures complete. Under the Clarke-McNary Act, under which the timber protective organizations operate, the members will get the usual refunds for expenses incurred on work they do.

The state forest service is allowed to do work on state-owned lands, and projects call for improvements on Indian Springs, Alexander Stephens Memorial Park at Crawfordville, Vogel Park at Neel Gap; also forestry work on the state forest at Augusta, state nurseries at Albany and Blairsville, and state lands at Milledgeville.

Applications and Applications

An applicant for a position in the forestry camp cited the fact that he had had several years' experience in operating a beauty parlor. He should have applied to the diplomatic service rather than to the forestry department.

Another applicant said he had roomed with a forester. This disqualified him. The possibilities were that what he had absorbed was not undiluted science.

C. C. C. CAMP FARE

"Are the men in Civilian Conservation Camps, or 'Reforestation Camps,' well taken care of?" is a question frequently asked.

The United States Army is apparently giving the men the best of care. For instance, the "Forestry News Digest" gives the following as sample camp menus for two days:

Breakfast: Oatmeal mush, milk, fried bacon, scrambled eggs, fried potatoes, bread, butter, coffee with milk and sugar. Dinner: Frankfurters and sauerkraut, boiled potatoes, creamed carrots and peas, bread, jam, doughnuts, coffee with sugar and milk. Supper: Chicken soup, croutons, roast beef, brown gravy, French baked potatoes, string beans, string bean salad, bread, butter, tapioca pudding, coffee with sugar and milk.

Breakfast: Fresh bananas, cornmeal mush, milk, hash, bread, butter, coffee with sugar and milk. Dinner: Irish stew, pickles, sliced onions, cabbage slaw, hot corn bread, butter, jam, apple pie, cocoa. Supper: Roast pork, mashed potatoes, radishes, green onions, pickles, bread, white or rye, butter, fruit cup, hot or iced tea.

HIGHEST GRADES FORESTRY EXAMINATION

Toombs County Students Won First and Second Highest Marks in Camp Scholarship Contest

The grades made by students contesting for the vocational forestry camp scholarships were based on 80 per cent for examination papers submitted and 20 per cent on general scholarship and character given by the vocational teachers.

The highest grade was won by Wilbur Blount, Vidalia, who received a mark of 99. The second highest grade was obtained by J. E. Odum, of Lyons, also of Toombs county, who received a grade of 98.

Other leaders are as follows:

Tharan Connell, Pavo High School, Pavo, 97.8.

J. H. Holloman, Richland High, Richland, 97 2-3.

Paul Jones, Nancy Hart Memorial, Elbert county, 97.

John Broadwell, Alpharetta High, Fulton county, 97.

Huie Brand O'Kelly, Madison county High, Danielsville, 97.

Tom Strickland, Dawnville High, Dalton, 97.

WHAT C. C. C. MEN CAN LEARN ABOUT FORESTRY

In cooperation with the Welfare Workers of the Army, the Georgia Forest Service is offering to give men in the C. C. C. camps instruction in the principles of forestry.

The forest service of Georgia has been carrying on six weeks courses in forestry in Vocational Forestry Camps for high school students, which, when successfully completed entitled the student to the certificate of Vocational Forester, and recommends him as capable of doing non-technical forestry jobs.

This course gives instruction in tree identification, tree seed collection and growing tree planting stock; timber cruising, which means estimating the volume of board feet in standing timber; forest fire prevention and forest fire fighting; planting, thinning, harvesting, marketing; uses of woods, and naval stores production.

Those who have been presenting these courses in vocational forestry are in charge of the C. C. C. camps in Georgia, and plans are on the way to have lectures on the above subjects presented in the camps.

Moving pictures and stereopticon slides, dealing with forestry will probably be used to supplement the lectures. Bulletins and leaflets dealing with forestry subjects will be made available at the camp reading rooms.

About 5 million cords of pulpwood are consumed annually by pulp and paper making industries of the United States.

STUDENTS FORESTRY CLUB ISSUES PAVO NEWS

High School with High Reputation for Forestry Work Prepares Is- sue of Local Paper and Uses Newsprint Made from Georgia Pines—Broadcast Forestry Radio Program

Pavo High School in Thomas county has been one of the outstanding schools of Georgia in carrying out the vocational forestry project. Prof. J. D. Davis, vocational agricultural teacher, has a knack of getting students intensely interested in his school projects.

On June 8 the Pavo High School Forestry Club issued a forestry edition of the Pavo Weekly News, and to give the undertaking a touch of enterprise, that issue of the paper was printed on paper made from Georgia pines obtained from the Savannah Pulp and Paper Laboratory of the State Department of Forestry and Geological Development.

The paper is filled with informative articles on forestry contributed by the students belonging to the Forestry Club. The front page first column article gives a "Brief History of Reforestation in the United States." The second column tells of the work of the Forestry Club. Then comes an interesting article by Herman Braddy on "The South the Coming Source of Woodpulp," and another article by the same author on "Production of Naval Stores in Georgia."

Ira Lee Adams writes on "Woods Fires, Their Prevention and the Damage They Do." Ben Byrd writes on "Community Reforestation." Tharan Connell tells of "Winning a Forestry Scholarship." Melvin Newsome writes of "My Forestry Project."

In the paper is the club's expression of thanks to Dr. Chas. H. Herty for Georgia pine paper on which to print the issue, and a statement from Editor P. W. Reddick, expressing his pleasure in cooperating with Pavo High School Forestry Club.

This outstanding work of the forestry club is not all. It has put on a forestry program, using WQDX at Thomasville, through the courtesy of Steve Luke, Manager. This broadcast was on June 3rd.

The Pavo High School, its principal, vocational agricultural teacher, students, newspaper and community are to be congratulated on this splendid promotion of the interests of forestry.

On the two quarter-acre sample plots of the school forest at Martin Institute at Sylvester, one plot being burned annually and the other left unburned, the increment of growth in 1932, as reported by Prof. Geo. I. Martin, is 2 1-2 times as great on the part kept free from fire as that on the burned over plot.



HOW YOUNG PINES GROW

In 1903 the Moultrie High School, Moultrie, Georgia, established a school forest and erected a sign to announce to the public that it was a "Demonstration Forest."

Note in the illustration the size of the young pines in 1930 and then observe in

the lower picture what had happened by April 1933. The trees had grown 8 to 10 feet high and the sign that stood up so prominently in 1930 is now almost hidden. Pines certainly do grow rapidly in the south.

SOME FACTS OF "THE COPELAND REPORT"

Forest lands of the United States in a productive condition will give constant employment to two million men.

Fire protection should be given 191 million acres more of forest land than at present.

At least 25 million acres of non-productive land should be planted to trees in the next 20 years.

A million dollar investment in pulp and paper plants can be permanently supplied by two million acres of productive forest land.

More than 50 million acres of agricultural lands originally timbered have been abandoned because they were never suited for agriculture.

The saw timber stands of the south amount to 200 billion board feet, which have been supplying for many years about one-half of the soft and hard woods lumber production of the entire country.

The hardwoods of the south aggregate nearly 80 billion board feet, supplying an annual cut of 7,500,000,000 board feet.

About 35 billion board feet of hardwood timber is located in the Appalachians, Piedmont Plateau and the uplands of Arkansas, Mississippi, Eastern Texas and Oklahoma.

About 45 billion board feet of hardwood occur in bottom lands and swamps of the coastal plain and lower Mississippi valley, of which more than one-third is old growth of the river bottoms of Arkansas, Mississippi and Louisiana.

FORESTRY QUESTION BOX

How is Civilian Conservation Corps Work in Forestry Directed in the State?

The work of thirty camps in Georgia on state and private lands is directed by the state forester and the work of five camps on national forest land is directed by the United States Forest Service.

All projects of work of a forestry nature are approved by the United States Forest Service; all work on state parks is approved by the United States Department of the Interior; finally, all projects both of forestry and parks are approved by Director Fechner in charge of this form of relief work.

Men between the ages of 18 and 25 with dependents were enlisted in Georgia by the head of the Reconstruction Finance Corporation, Mr. Herman De Laperriere, who in turn used the relief agencies of each county to select the men.

Technical men, camp supervisors, engineers, bosses, mechanics, etc., were appointed by State Forester with approval of Federal Inspector. The state forest service was also permitted to employ about 20 laborers locally without respect to age. The state selections are approved by co-operating state and federal agencies.

The United States Army took the enlisted men into army posts, conditioned them a few days, selected a camp site recommended by the state forest service, erected the camp and takes entire charge of the housing, clothing, feeding, medical service, etc., of the men while in camp. The forest agencies having planned the work to be done, take the men from the camps, transport them to various jobs, provide tools and equipment for work, boss the jobs and return the men to the care of the army officers till the next day. The forestry agencies buy the job equipment, the army buys food and camp supplies.

What Sort of Work Will the Civilian Conservation Corps do in Georgia?

The work in Georgia will be largely directed to provide facilities for forest fire control. Of these, the construction of forest firebreaks will require the most labor. Primary firebreaks of varying width will be constructed through communities and in some instances, practically throughout counties, by clearing strips of all growth and plowing them. Other fire control facilities consist of forest lookout towers to locate fires. These may be made of wood or steel and will be around 100 feet high. Telephone lines will be constructed to radiate from the lookout towers and facilitate the assembling of forest fire fighting crews.

The private land owners obligate themselves to maintain the firebreaks and to

build lateral firebreaks in line with recommendations of the district foresters, to man fire towers during the fire season and carry out such other work as is required of timber protective organizations of the state, for which, under the Clarke-McNary Act, the private land owner can receive partial reimbursement for expenditures made.

On state parks the work may consist not only of forest improvement, but the construction of roads, trails, walls, buildings; make plantings, do grading, etc.

What Entitles a Private Land Owner to Receive Conservation Corps Service in Georgia?

Those who, at the time the Act authorizing this work, were cooperating with state and federal agencies in organized forest fire prevention, are entitled to the service. But to promote the expansion of the organized areas to as large units as possible and reduce the fire hazards of a given region as much as possible by the work to be done, the areas added to the timber protective organizations since the Relief Act was passed are also entitled to the benefits.

SOME SILLY IDEAS

The report that the men enlisted in the Civilian Conservation Corps for forestry work is to get them ready for war, presumed to be in the offing. Of course the idea is silly.

The men enlisted for the forestry work do not belong to the army; they are given no military training; they are in the forestry camps for exactly the purpose which President Roosevelt has said, and that is to give work to unemployed whose families are in need.

The army manages the camps. What better force could do it? The men are worked by the forest service; and wielding an axe, digging and plowing could hardly be classed as military training. The men are enlisted for six months and can leave the job any time they get other employment.

FORESTRY AND RURAL LIFE

"It (forestry) offers one important means for maintaining a balanced rural economic and social structure in the parts of the country which will grow timber by utilizing all of the land productively for the purposes for which it is best suited, maintaining industries in perpetuity and holding a reasonable part of the population in the country in a healthy, diversified rural life."—Copeland Report on National Plan for American Forestry.

Wood put into the tomb of King Tut-ankh-amen 3,283 years ago, reported remarkably well preserved, has been identified as true cedar (*cedrus*).

VOCATIONAL FORESTRY CAMP AT CLARKESVILLE THIS YEAR

For the past two years the Vocational Forestry Camp has been held at Young Harris College near Hiawassee, but this summer the camp will be held at the A. & M. School at Clarkesville, where arrangements have been made that will allow coming within the reduced camp budget.

The buildings and equipment are available by courtesy of the University Board of Regents. W. E. Harvill and Hugh A. Inglis, principal and vocational teacher of the Clarkesville High School have contracted to take care of the camp in an acceptable manner.

The new camp quarters are near the lakes of northeast Georgia and in the foothills of the large mountains. Students will be given trips to the lakes, high mountains, and into the national forest.

Tennis courts, baseball field and other athletic conveniences are provided at the school. Students and teachers with their families will find Clarkesville readily accessible by railroad and automobile, and less expensive to reach than the former site.

Only the most pleasant relationships have existed between the camp officials and Young Harris College. Expense has been the deciding factor in making the change.

THINNING TURPENTINE FORESTS

Dr. Austin Cary, of the United States Forest Service, who has rendered much valuable service in studying pines of the south has been recording some of his findings in the Naval Stores Review. In an article discussing thinning, he brings out that the increment of increase due to thinning varies with soil conditions and is materially lessened by fire. An area in north Florida of pines 4 and 5 inches in diameter and around 35 feet high on poor soil and subjected to one severe fire, grew in three years only .4 inch in diameter and 3½ feet in height.

In striking contrast he cites a thinned plot in Camden county, Georgia. He says: "It was first laid out in January, 1930, and remeasured early in the present year (1933). The growth is slash pine which came on an old field 9 years old at the time of the first observation, and with an average height of strong trees not much under 30 feet. Fire has never touched it. On a plot thinned down to a stand of 235 trees to the acre the trees gained 1.8 inches in diameter and 11 feet in height on the average in the three years.

"During the same period an unthinned plot beside it, the trees standing at the rate of over 1,000 to the acre, gained very nearly the same indeed in height, but less than 1 inch in diameter, even taking into account the largest and most promising trees."

MONROE COUNTY HELD LARGE FORESTRY RALLY

Judge Ogden Persons, Vice President of Georgia Forestry Association, Planned Meeting — Prominent Speakers Heard

On Saturday, June 17, a meeting of over one hundred prominent land owners of Monroe county was held in the courthouse at Forsyth. The meeting was arranged by Judge Ogden Persons of Forsyth, vice-president of the Georgia Forestry Association, and an eminent jurist. The audience listened with keen interest to addresses delivered by prominent forestry leaders of the state.

Judge Persons presided. President T. G. Woolford, of the Georgia Forestry Association, Atlanta, was introduced as the first speaker. He spoke of the great value of the forests of Georgia and how the Georgia Forestry Association was formed by the citizens of the state to promote this great resource; how the association was instrumental in having a state forest service created; how the association has sponsored legislation for financing the state forest service, and how it was able to inaugurate the research work on the use of Georgia trees for making paper, now carried on by Dr. Charles H. Herty.

The association, he said, was lending a helping hand wherever possible to increase the forest wealth of Georgia and to develop new markets. He invited the citizens of Monroe county to join with the association in promoting the cause of forestry in Georgia.

The second speaker introduced was W. T. Anderson, editor of the Macon Telegraph, who spoke of the necessity of utilizing abandoned farm lands for growing timber and of protecting the lands from fire to get the greatest returns. He called attention to what it meant to wild life, especially quail, to protect the forests.

The final speaker, whom the audience was anxious to hear, was Dr. Charles H. Herty, in charge of the pulp and paper laboratory of the Department of Forestry and Geological Development of Georgia. Dr. Herty told of the purpose in establishing the laboratory which was to determine whether young pines especially, could be used in making white paper, in view of the fact that it had been shown that young pines before making heartwood did not contain more gum than trees commonly used.

The progress of the research work at the laboratory was recounted, showing that step by step misconceptions had been dispelled and fundamental facts determined which gave great promise of a successful solution of the economical use of pine wood for making newsprint paper.

Among the recent determinations made as to the tensile strength of pine paper, its absorption of printing ink and reproduction

of illustrations on a rapidly revolving press of a Savannah paper, it was found that the pine paper reproduced clear type prints and illustrations.

Dr. Herty called attention to the significance of paper mills to land owners in Georgia. It meant, he said, a new and profitable market for trees. To get ready for the possible demand he urged farmers to keep fires out of their forests so that new stands of timber can get a start through natural reforestation, and where seed trees do not exist, plant old fields to pines.

Dr. Herty's message made a most favorable impression.

Judge Persons introduced C. B. Harman, Atlanta, chairman of the executive committee of the Georgia Forestry Association; J. M. Mallory, vice-president, Savannah; Bonnell Stone, secretary, Oxford; and Miss Emily Woodward, Vienna, of the Georgia Forestry Association.

H. M. Peagler, Jr., Killed

A young man intensely interested in forestry, who on April 28th took part on the program at the annual meeting of the Georgia Forestry Association at Savannah, was slain at his forest cabin near Homerville on June 7 by axe murderers, apparently for the money he was known to have had on his person. Mr. Peagler's stolen car was found the next day near Jacksonville, Florida.

In Peagler's death one of the leading managers of large timber areas and a friend of forestry has been lost to the state.

FUTURE FARMERS OF GEORGIA DEDICATE MONTICELLO ROOM

A large delegation of future farmers of Georgia, students of Smith-Hughes Vocational Agricultural schools, made a pilgrimage to Monticello, the home of Thomas Jefferson, at Charlottesville, Va., and participated in the dedication of one of the rooms to Georgia Future Farmers.

The vocational students headed by their teachers also visited Washington to greet President Roosevelt and representatives in Congress from Georgia. The occasion was a great one in the lives of this group of rural boys of Georgia.

"The 670 million acres of forest and abandoned agricultural land now available for forestry is more than one-third of the total land area of the country, and more than half again as large as the area now devoted to farm crops."—The National Plan for American Forestry.

"If the objective of full forest land use can be reached, it will be a major contribution to the entire national land use problem."—The National Plan for American Forestry.

ATHENIAN CLAIMS FIRST CULTIVATED SLASH PINES

Growing About Fourth Faster than Uncultivated — Thomas Shackelford Writes Extension Forester His Results

In a letter written by Thomas J. Shackelford, Athens, to Extension Forester DuPre Barrett, Mr. Shackelford claims to have been the first to cultivate slash pines. The following is taken from his letter:

"I am writing to confirm my verbal order to you given several days ago for 6,000 slash pine seedlings. You will recall that I gave you an order in the spring of 1931 for 4,000 slash pine seedlings. Under your instructions perhaps I was the first one in the state to cultivate these slash pines. They respond to cultivation amazingly well. They grow almost one-fourth faster when they are cultivated.

"A few years ago I read a little pamphlet issued by Dr. David C. Barrow, in which he stated that he had allowed the pines to grow up on several acres of his farm in Oglethorpe county. He had these pines sawed into lumber in about twenty-eight or thirty years; that he sold the lumber for a splendid price and that a calculation showed that he received more money from the pines on this tract of land than he would have received if he had cultivated the land every year in crops. This pamphlet of Dr. Barrow is a wonderful argument in favor of reforestation.

"I hope that you will bend your energy in this direction. That is the greatest work that can be done in the aid of reforestation."

According to the National Coopers Journal, some beer kegs are being made of steel, but at that the forest is drawn upon for pitch lining to make conditions similar to kegs made of wood.

The Bureau of Plant Industry recommends a coat of paraffin on the back side of cedar lined chests and closets to prevent the unnecessary loss of the aroma of cedar on that side and thus prolong the usefulness of the odor.

"Under many conditions the forest probably offers the best and cheapest method available for erosion control and stream flow regulation. On scores of millions of acres the returns for this purpose alone would probably justify the expenditures required for keeping a forest."—The National Plan for American Forestry.

"Abundance of raw resources, including land and timber, has been one of the chief factors in the phenomenal growth of the United States. Their continued availability should be of equal or even more value in the future."—The National Plan for American Forestry.

SECOND DISTRICT

**Everett B. Stone, Jr., Dist.
Forester
Gainesville**

C. C. C. Activities

The Gainesville office has been the scene of much activity during the first three weeks of June in selecting the personnel for C. C. C. camps.

Five camps have been approved for the district as follows:

Project No. 51—Indian Springs, Butts county.

Project No. 69—Jackson county, near Commerce.

Project No. 73—Towns county, twelve miles south of Hiawasse.

Project No. 79—Habersham county, near Cornelia.

Project No. 55—Enotah, Union county, on the Appalachian Scenic Highway just beyond Neel Gap:

Active work has already begun on the projects in Jackson and Butts counties. The program calls for a large amount of work to be done on the Vogel State Park and the Indian Springs State Park, as well as improvement projects on other lands.

Work will be undertaken in Towns, Union, Habersham, Hall, Banks, Jackson, Madison, and Butts counties and possibly in other nearby counties.

THIRD DISTRICT

**C. N. Elliott, District Forester
Augusta**

Woodville Timber Protective Organization

Under the direction of several prominent Greene county land owners, a 67,000 acre T. P. O. was recently established for Greene county. This organization was given the name of Woodville T. P. O.

The land included lies on Little river in Greene and in portions of Oglethorpe counties, and the northern and western sections of Greene county.

The officers elected were C. J. Davison, President; R. R. Shaw, vice-President, and Frank Durham, Secretary and Treasurer.

E. C. W. Camps

To date (June 20) work has begun on the organization of three camps in the Augusta area. These camps are located in Stephens county, Taliaferro county, and Burke county.

The work outlined is mostly fire control with a program of planting, thinning, and general improvement on the Gwinn Nixon State Forest in Richmond county. This forest will be worked from the Burke County Camp.

Superintendents of the camps are as follows: Stephens County Camp, R. S. Thompson. Taliaferro County Camp, R. F.

Whelchel. Burke County Camp, J. L. Bolton. Additional personnel has been added locally to make up the 200 C. C. C. men.

New Organization

Hoyt McConnell, county agent of Warren county, is planning the establishment of a 25,000 acre T. P. O. for Warren county. Mr. McConnell advises that the owners are very much interested in the matter of fire control and their cooperation can easily be secured.

FOURTH DISTRICT

**W. G. Wallace, Dist. Forester
Columbus**

Pine Mountain T. P. O. Camp Manned

Two hundred and three recruits with supervising army and civilian personnel are busily at work establishing a small city in the woods in the vicinity of proposed work on Pine Mountain. Actual work on the T. P. O. forests will not begin until early July.

Capt. Russell B. Reynolds and his excellent corps of officers and regular army personnel plan to make this camp one of the most beautiful camps in Georgia. The unique background that such a unique mountain range as Pine Mountain is capable of giving makes this possible. Every effort is being made to make the men comfortable, and to make their sojourn in the Emergency Conservation Camp pleasant as well as profitable in a moral, physical, and mental way.

Mr. Lamar Flowers, Superintendent, and his twelve technical foremen are experienced men capable of turning out a high type of work, with the assistance of 203 young men not only physically but mentally fit to do the work properly.

Members of Mr. Flowers' staff are making excellent progress in signing up additional acreage and new members into the Pine Mountain T. P. O. Landowners are anxious to utilize this opportunity to establish an efficient forest fire protective system in their community.

Citizens of nearby towns and country are cooperating in every possible way to make this camp successful.

Taylor-Talbot T. P. O. Camp Manned

The Taylor-Talbot Emergency Conservation Camp of approximately 200 young men and supervising personnel is well established, and the regular work as outlined by the Georgia Forest Service is beginning to take form. Camp Commandant Lt. John A. Stewart and Mr. L. B. Barrett, superintendent of the forestry work, together with their corps of trained army and civilian personnel are busily at work establishing a permanent, orderly camp with comforts and recreational facilities designed to make these young men contented.

From all reports, this group of young men promises to be one of the best working crews in Georgia. They not only expect to turn out a high type of work, but they also expect to turn out baseball and other athletic teams that will give all opponents considerable opposition.

The citizens of Butler and surrounding country showed their cooperative spirit to perfection beginning with the arrival of the train in Butler bearing these young men and their equipment. They have further shown their interest by the fact that close to 100,000 acres of timberland have been signed up in the Taylor-Talbot T. P. O. within the past few weeks as eligible for establishing thereon an efficient forest fire protection system.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

At a recent meeting of the officers of the Chatham Timber Protective Organization, which included Mr. Elliott Reed, Secretary and Treasurer; Mr. O. T. McIntosh of the Southern States Naval Stores Company, and Mr. J. A. Carter, Vice-President of the T. P. O., the name was changed to Ogeechee Timber Protective Organization which enabled them to include lands in both Bryan and Chatham counties.

The old Chatham T. P. O. never did function as a unit, and since reorganizing and obtaining new members, it will have some forty-five members and control seventy-five thousand acres of land in Chatham and Bryan counties. The acreage of the old Chatham T. P. O. was very scattered, which was one reason it was hard to manage. Now the land is one solid body.

Liberty and Long T. P. O.'s Enlarged

At a joint meeting of landowners of the two counties, and members of the Liberty and Long T. P. O.'s, new members were added to each, which brings the total acreage in the Liberty T. P. O. up from twenty thousand to one hundred two thousand acres, with about sixty new members. The Long T. P. O. signed about thirty new members and brought their total acreage up from eleven thousand to forty thousand and expect to increase it still more.

Members of the Long and Liberty T. P. O.'s are taking advantage of the opportunity to have primary firebreaks constructed on their lands, and also lookout towers and an efficient telephone system put in. These improvements have been needed for a long time, but the members never had the money to spend at one time, so now they are getting the work done through the E. C. W. camps and plan to maintain the system after it is put in.

Australia claims taller trees than California. A species of eucalyptus is reported to have attained heights approximating 500 feet.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE PRECIOUS STONES OF GEORGIA

GEOFFREY W. CRICKMAY

The precious stones, or gems, include all minerals that are prized for personal ornament on account of their color, luster, transparency, or hardness. The value of gem stones has a wide range and it is usual to refer to the rarer, more expensive stones, such as ruby and diamond, as "precious," and to the commoner, cheaper stones, such as aquamarine and garnet, as "semi-precious." It is to the latter group that most of the Georgia gem stones belong. The value of stones of the same species also varies according to individual characteristics. A bluish diamond is far more highly prized than the yellowish variety, and red corundum, or ruby, is many times more valuable than yellow corundum, or oriental opaz. Peculiarly enough, the most attractive colors are commonly due to matter foreign to the essential composition of the mineral. Thus the three aristocrats of colored stones, the sapphire (blue), ruby (red), and emerald (green) owe their inimitable color to a minute amount of impurities such as nickel and chromium oxide.

The luster of a gem is dependent on the manner in which light passes through it; that is, on its index of refraction. Diamond has a very high index of refraction which accounts for its splendid play of colors, but quartz has a low index and consequently a vitreous, almost greasy, luster. Gems are cut so as to exhibit their luster to best advantage. There are two main forms in which stones are cut: the facet cut, in which the stone is ground with plane surfaces, and the cabochon cut, in which the stone is ground with curved surfaces. Both have numerous variations to each of which a special name is applied by the lapidary. In general, clear stones such as the diamond, aquamarine, and amethyst, are facet cut, whereas translucent stones such as carnelian, moonstone, and opal, are cut "en cabochon."

The hardness of a stone makes really very little difference to its beauty, but from a practical standpoint it is an important quality of any gem. A soft stone, particularly a facet-cut transparent stone, may be ruined by a few scratches. Diamond is the hardest of all stones, in fact, diamond

dust is used to a large extent in cutting and polishing other gems. The quality of hardness is one of the simplest criterion to distinguish between the genuine and imitation stone. The cheapest and commonest imitations are made of colored glass, and of these it can be said that beautiful imitations have been made, but they generally lack the luster and always lack the hardness of the genuine. Glass can be scratched with a knife, most true gems cannot; moreover, most true gems will scratch glass. Proper care, however, should be made when applying such tests for a delicately cut gem may easily be ruined by roughly attacking it with a knife.

The precious stones of Georgia are found mainly in the area of crystalline rocks, that is, in the mountains and in the Piedmont Plateau, but a few, such as opal, chalcodony, jasper, and agate occur in the Coastal Plain. There are no localities at which a variety of gem minerals are particularly abundant, but there are places where particularly good specimens of certain minerals occur and these are noted below. It is not at all necessary for the amateur collector to have his stones cut; rough specimens make a fine cabinet display and have the additional advantage of illustrating the mode of occurrence of each mineral. With a keen eye anyone can collect a dozen or more varieties of semi-precious stones with little difficulty.

The novice may have some difficulty in identifying his specimens. At the end of this article is a list of a few books on gems that may be referred to. In addition, the collections at the State Capitol offer an abundance of material with which comparisons may be made. Certain identification can be made by submitting the mineral to the State Geologist at the State Capitol.

The following is a list of precious stones that occur in Georgia:

Diamond is a crystalline form of carbon and in this respect it is similar to graphite. A number of diamonds have been reported found in Georgia, but in most cases the finds have lacked verification. Hall, White, Habersham, Banks, Lumpkin, Dawson, Forsyth, Gwinnett, Cherokee, Clayton, Bartow, Haralson, Carroll, Paulding, Cobb and

Twiggs counties are reported to have yielded diamonds. The finds have all been made in placer deposits or in the coastal plain, that is, they have been transported from their original place of formation, and it is not known where or from what rocks they have been derived.

Corundum is aluminum oxide. The mineral generally has a cloudy grey, pink, red, or blue color. When it is clear, corundum becomes a gem stone and depending on the color is known as ruby (red), sapphire (blue), oriental topaz (yellow), oriental emerald (green), violet sapphire (violet). The stone is exceeded in hardness only by diamond, and on this account the common cloudy corundum is used as an abrasive. Corundum deposits occur in Rabun, Towns, Union, Habersham, Lumpkin, Hall, Forsyth, Cherokee, Walton, Cobb, Paulding, Douglas, Carroll, Heard, Troup, and Upson counties, and in the past some mining of the stone for abrasive purposes has been carried on. Clear stones appear to be rare and those that have been found are small. Rubies have been mined in Macon county, North Carolina, in deposits somewhat similar to those occurring in Georgia and it does not seem improbable that rubies, sapphires, or some other form of transparent gem corundum may be found within the known corundum-bearing areas of the State.

Quartz is one of the commonest of all minerals. It occurs in two forms: crystalline and non-crystalline, or crypto-crystalline. In both types it has the same chemical composition, silicon dioxide.

The crystalline varieties of quartz that are used for gems are transparent and have a vitreous luster. This luster prevents the slightest confusion between colorless quartz, rock crystal, and diamond, a confusion that is not uncommon. Rock crystal is found in Rabun, Forsyth, Jones, Wilkes, Franklin, Fulton, and other counties. The material is usually cut with facets, although the chatoyant varieties such as that from the Kell Mica Mine in Rabun county are best cut "en cabochon." Amethyst is the violet or purple variety of crystalline quartz. Rabun county has furnished some of the finest amethysts obtained in this country, but no systematic search for them has ever been instituted. To be of gem quality an amethyst must be quite free from cloudiness and, further, the color must be deep and evenly distributed. Rose quartz with a beautiful chatoyance, approaching opalescence, occurs in Rabun county but the color, not being very deep, rapidly fades on exposure. Smoky quartz has been found in Rabun, Elbert, Franklin, Towns and Talbot counties. The smoky color is thought to be due to organic matter, for when a specimen is heated the color fast disappears and the stone turns yellow.

The non-crystalline varieties of quartz include chalcedony, agate and jasper. Chalcedony is a grey to blue form with a waxy luster. Near Cordele, Crisp county, dendritic markings of manganese or iron oxide occur in chalcedony, which is known for this reason as moss agate. Corals that have been replaced by chalcedony so as to preserve the coralline structure occur in Lowndes, Brooks, and Thomas counties. Agates are distinguished by having a banded form, each band having a different shade of color. Agates have been found near Round Oak, Jones county, near Marietta, Cobb county, in Baldwin and in Fulton counties. Jasper is an opaque stone, most commonly of a brown or red color. On account of its hardness, which is shared by all varieties of quartz, it takes and retains a very high polish. A reddish brown jasper occurs near Round Oak, Jones county; brown jasper is found near Clarksville, Habersham county; red jasper on Flint River near Albany; yellow-brown jasper near Elko, Houston county.

Opal is little more than a variety of crypto-crystalline quartz, for aside from a small amount of water its composition is the same. As a gem stone, however, opal is far superior to any form of quartz. Its brilliant opalescence is not due to pigment but rather to the refraction of light that passes through the stone. The effect is similar to that seen where a thin film of oil floats on water, but in opal a play of colors is produced that is unmatched in any other stone. No precious opal is known to occur in Georgia. A fire opal has been found near Chalker, Washington county. Hyalite, a clear glassy variety of opal, has been found at Laurel Creek corundum mines, Rabun county.

Beryl is a beryllium aluminum silicate occurring mainly with certain coarse-grained rocks known as pegmatites. The dark green beryl is known as emerald, the greenish blue as aquamarine, and the yellow as golden beryl. Common green beryl is known at many localities in the area of crystalline rocks but on account of inferior transparency is of little value as a gem. Aquamarine occurs in Rabun and Franklin counties. Emerald and golden beryl are not known to occur in Georgia.

Garnet is a common mineral in the crystalline rocks of the state but only rarely is it clear enough or large enough for gem material. The commonest color is deep red, almandine, more rarely cinnamon color, esonite. The crystals commonly have a rusty coating due to iron oxides that have been leached from the mineral. Garnet is particularly abundant in Hall, Lumpkin, Dawson, Cherokee, Hart, Rabun and Carroll counties. It is reasonable to predict that a careful search would reveal material that could be used either for gems or watch

jewels. Garnets are usually cut with facets; a cabochon-cut garnet is known as a carbuncle.

Moonstone is a form of feldspar which exhibits a beautiful pale blue chatoyance or opalescence. Fair gems have been cut from specimens obtained from near Buford, Gwinnett county, and from near Thomas-ton, Upson county. The most attractive features of the stone are best displayed in the cabochon cut, upon whose upper surface an intaglio or cameo may be engraved.

Rutile is the oxide of titanium, usually black or reddish brown in color. At Graves Mountain, Lincoln county, some of the finest crystals of rutile in the world have been collected. The material is used both in the natural state and as cut gems.

Zircon is one of the few gems having a luster approaching that of diamond but it lacks the play of colors. Opaque crystals have been found at the Glades mine, Hall county, but are not of gem value.

Kyanite is a silicate of alumina now sought after for its refractory qualities. Although it occurs at several localities in the state, it is not of the quality required for gem stones. Good cabinet specimens may be obtained in Cobb, Cherokee, Habersham and Upson counties.

Lazulite is a phosphate of alumina, containing magnesia and iron. It occurs in fine pale blue crystals at Graves Mountain, Lincoln county, but is too soft to cut as gems.

Epidote has a very limited use in jewelry. Most of the epidote found in Georgia is not perfectly transparent but it is not improbable that clear stones will be found. Its peculiar pistachio green color, found in few other stones, is its most attractive characteristic.

Staurolite occurs in Fannin and Cherokee counties in cruciform crystals which uncut form natural ornaments which are sometimes known as fairy stones.

Pearls. A few valuable pearls have been obtained from shells of mussels in streams in the northwestern part of the state. The pearls obtained from the oyster along the coast lack luster and are of little or no value.

References to Precious Stones:

S. W. McCallie, "Mineral Resources of Georgia," Georgia Geological Survey, Bull. 23, 1926.

O. C. Farrington, "Gems and Gem Minerals," Chicago, 1903.

G. F. Kunz, "The Magic of Jewels and Charms," Philadelphia, 1915.

Max Bauer, "Precious Stones," London, 1904.

Reforestation in Georgia is carried on mainly by keeping out fires and letting nature do the rest.

C. C. CAMP LOCATIONS AND CAMP SUPERINTENDENTS

The location of the Civilian Conservation Corps camps and the camp superintendents, on state forestry projects, are as follows:

Blanton Clement, Indian Springs, Ga.

T. H. Brown, Homerville, Ga.

C. J. Martin, Hinesville, Ga.

Eitel Bauer, Albany, Ga.

J. B. Baskins, Blairsville, Ga.

Lamar Flowers, Warm Springs, Ga.

J. L. Bolton, Waynesboro, Ga.

C. M. Simmons, Ellijay, Ga.

Fred C. Myers, Fargo, Ga.

Elmer Dyals, Woodbine, Ga.

J. J. Walker, Soperton, Ga.

H. C. Brown, Baxley, Ga.

W. A. Whatley, McRae, Ga.

Fred Welchel, Crawfordville, Ga.

R. B. Sanders, Jesup, Ga.

E. T. Gabriel, Statesboro, Ga.

R. D. Franklin, Bainbridge, Ga.

C. L. Burnett, Denton, Ga.

S. A. Darnell, Commerce, Ga.

G. C. Rogers, Nahunta, Ga.

R. E. Tittle, St. George, Ga.

L. I. Martin, Waycross, Ga.

C. J. Oliver, Gainesville, Ga.

R. S. Thompson, Toccoa, Ga.

L. C. Hart, Ft. Gaines, Ga.

C. G. Trowbridge, Chula, Ga.

L. B. Barrett, Butler, Ga.

L. M. Oliver, Cornelia, Ga.

L. E. Ledbetter, Menlo, Ga.

Kieffer Lindsey, Jasper, Ga.

GEOLOGISTS STUDY FOSSILS OF DAHLONEGA AREA

Edwin C. Eckel, Washington, D. C., formerly with the United States Geological Survey, and Mrs. Junea W. Kelly, of the University of California, spent a part of June in the region of Dahlonega studying fossil remains to determine their geological status.

Mr. Eckel made a geological survey of the region several years ago and discovered at that time some interesting fossils, among them the leaves and seed of the larch, a species of tree not now found in its native state less than 400 miles further north.

Mr. Eckel and Mrs. Kelly made studies in the Great Smoky Mountain National Park in Tennessee before coming to Georgia, and expect to develop data of importance regarding the time certain fauna and flora appeared.

"It has been estimated that 1,000 years may be necessary to build up an inch of soil, an amount which often is removed by erosion in one year."—The National Plan for American Forestry.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 3

ATLANTA, GA., AUGUST, 1933

No. 8

VOCATIONAL FORESTRY CAMP IN SESSION AT CLARKESVILLE

**Select Group of Outstanding Farm
Boys of State Started Camp Work
July 24 to Continue to August 12
—Interested in Work and Enjoy-
ing Camp**

The annual vocational forestry camp is being held in the old A. & M. School at Clarkesville, beginning July 24 and continuing to August 12. Over one hundred high class boys from Smith-Hughes rural high schools all over the state are in attendance, doing good work and enjoying the camp. Of this number 50 are completing their second year's camp work and if satisfactory records are made, they will all receive certificates of Vocational Forester. Several of those who received certificates last year and applied for work in C. C. C. camps are now engaged in forestry work.

On account of the district foresters being very busy with the C. C. C. camps, they are unable to do their usual camp instruction work. In their stead, extension foresters are presenting courses assisted by agricultural vocational teachers. The faculty leaders are C. A. Whittle, Bonnell Stone, DuPre Barrett and L. E. Cox, with M. D. Mobley as Camp Supervisor.

The work, as usual, is carried on largely in the woods and deals in a practical way with things every farmer ought to know about forestry, such as tree identification, estimating the volume of standing timber, harvesting and marketing, uses of wood, thinning of forests, fire prevention methods, gathering of tree seed, and growing seedlings for planting.

Moving pictures, lectures by prominent speakers, excursions, athletic contests, swimming, boating add interest and entertainment to the camp. The camp is proving a real event in the lives of these fine young rural boys of Georgia.

A list of the students and their home addresses is as follows:

Wilbur Scarborough, Nashville; Joe Adams, Walden; Frank Proctor, Arcola; Tim Stafford, Claxton; Harold Morris, Genola; Grady Pittard, Jr., Winterville; Lake Poteete, Kennesaw; Edgar Keller,

Eastanollee; Charles C. Mathis, Louvale; Elmer Larsen, DeSoto; Ernest Lee, Americus; Herman Braddy, Pavo; Delmas Galbreath, Vidalia; Hugh Gillis, Soperton; John Bond, Dalton; Eugene Adams, Norman Park; Quinton Mathis, Adel; Theo Hughes, Dougherty; Etheridge Keith, Doraville; W. O. Hudson, Jr., Elberton; Truitt Drake, Adrian; James Gillespie, Carnesville; Willard Fain, Ellijay; J. W. Butler, Calhoun; Carson Britt, Lawrenceville; Grady Lumpkin, Clarkesville; James Cochran, Lavonia; Lewis Weaver, Hogansville; Ulysses Carlan, Commerce; Clinton Wilburn, Wrens; DuPree Price, Kite; James Conine, Stockton; Parker Bedingfield, Cadwell; Julian Smith, Ludowici; J. B. Echols, Danielsville; Lee Roy Thomas, Pelham; Jack Paul, Sylvester; Floyd Morgan, Screven; John Wesley Alston, Preston; Sim Lynn, Washington; Bill Warren, Dublin; John Everett Noland, Walker Park; Bill Crosby, Sale City; Cecil Parks, Howard; Elmer Hendrix, Gore; J. C. Davis, Homer; Champ Jackson, Winder; Marvin Stephens, Fairburn; F. W. Jones, Omega; Joe H. Underwood, Waresboro; J. D. Cowart, Epworth; Benjamin Gay, Madison; Gladstone McClain, Rabun Gap; Charles M. Smoak, Jr., Griffin; Farris Carlan, Homer; Robert Smith, Lorane; Ralph Johnson, Winder; J. W. Donaldson, Jr., Register; Barron Cochran, Girard; Render Rowe, Carrollton; Homer Winkle, Armuchee; Robert Poteete, Kennesaw; Elmon Vickers, Norman Park; Ashley Whitehurst, Adel; Jim Hulse, Dawsonville; Charles Head, Chamblee; Charlie Gunn, Vienna; Paul Jones, Middleton; Calvin Ellington, Summit; Howard Tatum, Dawsonville; John Broadwell, Alpharetta; Bill Oliver, Martin; Woodrow Osborn, Ellijay; Wayne Bowles, Calhoun; Quinton Rooks, Dacula; Eugene English, Demorest; Dorsey King, Lavonia; Solon Owensby, Franklin; Teeny Hardwick Floyd, Ocilla; Oliver C. Anderson, Matthews; Elton Riner, Kite; Edwin Lloyd, Stockton; Virginee Coleman, Plainfield; Alton Hodges, Ludowici; O. M. Cates, Jr., Meigs; Huie Brand O'Kelly, Danielsville; Holland Tuck, Oxford; Paul Roby, Rabun Gap; J. H. Holloman, Richland; Perry Foster, Jr., Leslie; Tharan Connell, Pavo; Russell Willis, Ty Ty; Wilbur Blount, Vidalia; Shad Callo-way, Hogansville; Austin Avery, Adrian;

NOTABLE FORESTRY ADDRESS T. J. HAMILTON, AUGUSTA

**Extracts from Keynote Address before Georgia Forestry Association
by Editor Augusta Chronicle —
Sketches Progress of Forestry in
Georgia.**

A brief reference has hitherto been made in these columns to the address of Editor Thomas J. Hamilton of the Augusta Chronicle before the annual meeting of the Georgia Forestry Association. Fuller excerpts from the notable keynote address are reproduced herewith as a valuable addition to the forestry literature of Georgia.

"I wish to compliment those pioneers who formed this Association some eight or ten years ago, who laid the foundation for the present great work that is being done by the state in cooperation with the Federal government. This is certainly the time of all times to go forward for our great President is leading the way toward conservation, reforestation, and flood control by marshaling armies, totalling some 250,000 men who will be put at work all over this country and several thousand of whom will work in Georgia.

"In order to discuss intelligently forestry in Georgia, perhaps I should lay the background by discussion of forestry in general. Forestry is an old subject, although in America there was no national forestry organization until 1875 when the American Forestry Association was formed in Chicago. However, back in England in the early part of the eighteenth century the problem caused by the exhaustion of forests for lumber and wood became so acute that reforestation was begun and now the artificial forests of the United Kingdom form a larger area than the natural forests. For hundreds of years prior to this time the question of forests was an acute and live issue in England, for the kings from the Anglo-Saxon period on

(Continued on Page 2, Col. 1)

J. L. Spence, Waresboro; Dock Akin, Screven; Paul Rees, Preston; Tom Strickland, Dalton; Lee Sisson, Rayle; I. J. Medders, Sylvester; Keith Barnett, Bogart; Sam Loyd Whitmore, Eastanollee.

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Dupre Barrett,.....Athens
K. S. Trowbridge,.....Tifton

NOTABLE FORESTRY ADDRESS T. J. HAMILTON, AUGUSTA

(Continued from Page 1)

down to the eighteenth century had a habit of declaring large areas as forests. Sometimes the areas would include villages and farms of the countryside and the people at times were allowed to remain but at other times were evicted, force being used in the process of what was known as afforestation, which was declaring a large area of land to belong to the crown for the purpose of hunting, fishing, and so on. Of course, when government by the people came to England, this practice was stopped and the rights of the people were respected.

"To give you an idea as to the enormous problem of forestry in this country, there are 550,000,000 acres of forest lands in America, comprising 29 per cent of the area of the country, and that fires destroy \$25,000,000 worth of forest products a year and cause an annual average loss of seventy lives; that little attention was paid in this country to forestry until the first government appropriation was made in 1876 when forestry was made a part of the

Department of Agriculture and the annual appropriation of \$30,000 has been increased to millions of dollars each year.

"In 1891 congress began the first of its appropriations for national forests and 155,000,000 acres are now in the national forests of this country with more than 150 national forests. It might interest you to know that approximately \$3,000,000 is secured by the government each year from the timber and the grazing fees, with more than 3,000,000 goats and sheep and about 2,000,000 cattle grazing government forest lands in the West.

"Forestry was first taught in America at the University of Montana in 1897, and in 1898 Biltmore Forestry School was begun and at the same time Cornell University established a branch of forestry. It was up at Biltmore forest, owned by Mr. George W. Vanderbilt, that forestation work on private lands was begun and which consisted mainly of fire protection. This great Vanderbilt Estate is now a part of one of our national forests.

"It might further interest you to know that there is some twenty-eight hundred billion board feet of lumber in this country, of which one-half is in California and the Pacific Northwest, one-fourth in the South and the other fourth in the remaining sections of the country.

"Now, let's see what Georgia has done in forestry work. It has been twenty-seven years since the Department of Forestry was established at the University of Georgia and this state was one of the pioneers in regard to education of foresters. We have now between fifty and sixty men in this Department of the University, with four instructors, and the course is rapidly growing in popularity, offering the degree of Bachelor of Science in forestry.

"In 1925 the legislature began to make annual appropriations, giving annually a total of \$50,000 to the Department of Geology and Forestry, with \$20,000 to \$25,000 for forestry, which is, of course, entirely too small an amount, but which under present conditions we do not criticize.

"To sum up the ultimate objectives of the Georgia Forestry Association, I would give the following:

"Vastly increase our timber supply and, therefore, our state wealth.

"Through experimentation and research develop new uses for our forest products just as Dr. Herty is doing at Savannah.

"Turn barren, gully washed and worn out land into productiveness by crops of pine.

"Protect watersheds of our rivers by reforestation of denuded area to aid flood control, power and navigation.

"To provide preserves for game birds, animals and fish, where under intelligently enforced game laws Georgia may become a paradise for sportsmen and help make

Georgia the winter playground of the nation.

"In Georgia we have some 46,000,000 acres of land of which 23,000,000 are classed as forest. Up until the last few years we paid no attention to our forests but went about in the merciless manner of destruction without any replacement, except what nature did.

"Georgia with her 150,000 acres in public lands embraced in three big national forests and with nearly 23,000,000 acres of private lands, that need the touch of the forester's hand, is a state which should respond enthusiastically to the great movement planned by President Roosevelt. We hope and believe that our State Forester, with seven district foresters, will sign up hundreds of thousands of acres of private lands which need protection from fires, need thinning and need planting and other work done.

"We all know that Georgia's forest crop, including timber, naval stores, etc., is now second in value to her cotton crop, and we have been told that at the present moment Georgia is producing more timber than she is cutting. However, I believe this to be on account of the fact that there has been stagnation in the building business for the last three or four years, for certainly under normal conditions we are cutting our timber much faster than it is being grown.

"I can see the dawn of a day in Georgia when we shall grow a crop of pine for market every seven years, and I think that the experiments of Dr. Charles H. Herty will prove so successful that the pulp industry will become one of the greatest of our state. Indeed, I think that Dr. Herty will be one Georgian who will be memorialized in stone and bronze statues as well as in the hearts of his fellow-citizens ere he passes on to his reward."

COMMERCIAL ORGANIZATIONS FAVOR STATE PARKS

At the annual convention of the Georgia Association of Commercial Secretaries, held at Elberton July 15, 1933, a resolution favoring state parks, introduced by Thomas R. Jones, Savannah, and seconded by Roy W. Ulrich, of Atlanta, passed unanimously. The resolution is as follows:

WHEREAS, the Georgia Forestry Association is formulating and promoting a plan for a statewide system of parks; and

WHEREAS, the historical and educational value of such a system would be very great and would attract additional tourist visitors to Georgia;

BE IT RESOLVED, that the Georgia Association of Commercial Secretaries hereby endorses and approves of this plan and expresses its belief that no better publicity could be secured for our State.

FORESTRY QUESTION BOX

Wilbur Blount, Vidalia High School, Vidalia, received the highest grade in the state forestry examination for the Vocational Forestry Camp scholarships, his mark being 99. General scholarship and character are also rated in arriving at this figure.

The questions and answers given by him are as follows:

What are the leading species of trees in your territory?

Longleaf pine, slash pine, yellow poplar, cypress, red maple, live oak, black gum, sweet gum, tupelo gum and sycamore.

What species of pine predominate in the coastal plain, piedmont and mountain sections of Georgia?

Slash and longleaf pine predominate in the coastal plain; short-leaf and loblolly in the piedmont and scrub, white and pitch pine in the mountains.

Name five leading species of oaks found in Georgia.

White oak, live oak, post oak, chestnut oak and red oak.

Name some of the trees that grow in swamps of Georgia.

Black gum, tupelo gum, sweet gum, cypress and yellow poplar.

What are leading uses of the wood of the following trees: White oak, hickory, red gum, cypress?

White oak—wagon spokes and hubs, baskets, crates, tool handles, flooring, interior finishing and furniture;

Hickory—Tool handles, athletic goods, spokes and rims for wheels, furniture.

Red gum—Veneer, furniture, cabinets, interior finishing, lumber, gunstocks and musical instruments.

Cypress—Lumber, shingles, crossties, telegraph and telephone poles, fence posts, bridges, piling and beams.

What is the most practical firebreak in your section of the state?

The plowed break. The way to make it is to use a turning plow pulled by mules, or tractor and plow, and plow up a strip about fifteen feet wide the first year and increase the width each year until you have it as wide as you want it. Then plant some good pasture grass on it to serve for grazing as well as a firebreak. You cannot say how wide to make it, for firebreaks range from 20 to 100 feet wide. The variation is because of the location, the amount of undergrowth and grass on the land.

What is the best method of chipping pines for naval stores? (a) Kind of pines; (b) Diameter of trees; (c) Best method of procedure.

(a) Kinds of pines, slash and longleaf.

(b) Do not chip trees under 9 to 10 inches in diameter breast high.

(c) The best methods of procedure are as follows: Do not put over two cups to any tree and use two cups only on trees over 14 inches in diameter breast high. Do not chip higher than 16 inches a year, nor deeper than one-half an inch under the bark, nor chip wider than one-half an inch per streak.

Trees that measure 12 to 14 inches in diameter (D.B.H.) the chipping face should not exceed 8 inches in width, and on trees over 16 inches in diameter, the face should not be over 10 to 12 inches in width.

What Species of pine would you recommend planting in your Section of the State?

Slash and longleaf.

Describe methods of planting pines (a) care of seedlings; (b) spacing; (c) setting out seedlings.

(a) The best way to get seedlings out of the nursery bed is to run a shovel under them, loosen the dirt, then pull them up. In this way the root will not be injured badly. Keep the roots in wet mud or moss to keep them from drying out and place them in shade or keep wet sacks over them till ready to plant.

(b) In spacing for poles and lumber, set the seedlings 6 to 7 feet apart. In spacing for gum, have them 10 to 12 feet apart. In spacing for dual purposes, set them 8 or 9 feet apart.

(c) In setting seedlings, the best way is to use a dibble or spade to make a v-shaped hole in the ground. Put the seedling in it then pack dirt around it well, but at the top leave the dirt unpacked to form a mulch that will keep the dirt below from drying out. Set the seedlings as deep as they were in the seed bed.

What damage is caused by forest fire?

It kills seeds and seedlings, thereby preventing reforestation; burns and scars trees and in so doing retards their growth; burns up humus and promotes a quick runoff of water; through scars on trees made by fire, rat fungi attack and damage trees; reduce ability of ground to absorb rainfall, thereby causing erosion, loss of soil fertility, increasing floods which annually take heavy toll of life and property and deprive forest soils of enough water for maximum growth; destroys pasture grasses and kills small game.

When should you gather pine seed for planting?

You should gather pine cones for planting seed about October 1, or about a week or two before seed fall out. Cones are ready to harvest when they turn from green to brownish green and start cracking in places.

When is the best time to thin a forest,

and what disposition would you make of thinnings?

The best time to thin a forest is in the winter when the trees are not making growth and when insects are not present. If cut in the summer insects would be attracted and attack the live trees, sometimes killing them.

If the trees cut out in thinning are big enough, the wood can be used more handily than in the summer.

How would you thin a young pine forest with a thick stand about 15 feet high (a) spacing, (b) trees to be favored.

The spacing of trees would vary in distance according to what one wants to use them for. I would want them for dual purpose and space them 8 or 9 feet apart. I would favor trees that were the best distance apart, but in case of a big and small tree together, I would usually cut out the smaller unless the larger has some defects. I would cut out diseased, scarred, crooked, suppressed and small ones, where too thick.

What species of trees are most desirable for fence posts, poles and piles?

Heart pine, cypress, cedar, black locust, mulberry and post oak.

NEW DEVICES INCREASE POSSIBLE WOOD USES

"Modern Connectors for Timber Construction" is the name of a bulletin issued by the Department of Commerce of the United States and the Forest Products Laboratory of the U. S. Department of Agriculture, that tells of "the most important developments in wood construction for a century", according to Dr. Wilson Compton, president of the American Forest Products Industries of Washington.

The connector consists of a new series of timber joining devices, such as metal rings, discs and plates used for reinforcing customary bolts, thereby increasing the strength of the joints from four to eight times and resulting in economy of construction costs.

This bulletin is available from the National Committee on Wood Utilization, Department of Commerce, Washington, D. C.

Membership Drive

The Georgia Forestry Association is putting on a drive for membership and is planning to have a county chairman in every county. The campaign is conducted by Roland Turner, Agricultural Director of the Southern Railway, assisted by C. B. Harman, Atlanta, Chairman of the executive committee.

Alex K. Sessoms, member of the Commission of Forestry and Geological Development of Georgia, is on a two-months tour of the west.

C. C. C. CAMP NOTES

Torso Nudes

They call them the "bronze boys", those shirtless chaps—torso nudes, of the 3-C camps. These bronze woodsmen like it that way; it is the thing in camp circles to expose down to the waist; to mop up the sun's rays, and take wind and rain as it comes, with no thought of pampering the body with protective means. What a man! a wood's-man!

What a delight to see the bronze muscles rippling smoothly, freely, rhythmically, as the body sways to the axe, the mattock, the saw, the shovel.

Above the bronze chest and shoulders, a bare head, a tanned, healthy, glowing face with sparkling eyes and a cheerful smile. You naturally wave a greeting and smile back as you pass.

A Diet Confession

"What kind of bread do you get?" was asked of a C-boy.

"Boughten" was the response of a nut brown woodsman hailing from the hinterland.

"Do you like it?" I asked.

"Oh, it does all right, but there ain't nothing goes right with meat and vegetables 'cept pone corn bread."

Swamp Boys in Mountains

It so happens that men enlisted in the lowlands of North Carolina found themselves elevated two or three thousand feet above their former habitat, and encamped in the Blue Ridge mountains of Georgia, far from the haunts of man.

Many of the boys had never seen mountains before. The highlands were awesome. How a man could climb the slopes and cling to them, let alone work, was a fearful prospect to these flat landers.

But they have taken enthusiastically to their new environment; they have learned that they do not have to be flies to cling to mountain sides and that if they slip, they do not necessarily fall all the way to the bottom of the mountain. They are finding plenty to write home about.

Camp Athletics

An extensive line of athletics and inter-camp contests is being planned. In selecting camp sites, consideration has been given to convenient athletic fields for baseball, football, basket ball, volley ball, tennis, etc. Saturdays will be devoted largely to athletics.

Wouldn't a lot of colleges like to have some of those highly conditioned, bronze colored, steel muscled young men for their football team this summer? We say they would.

Lassoing a Rattler

Camp boys are death to snakes. A story comes from the Hiawasse Camp of a boy who found a ten-button rattler, and deciding that it would be a suitable beginning of a camp zoo, proceeded to lasso the reptile and carry it to camp. There the boy was exciting much curiosity by displaying his captive, when the officer in charge required him to kill it.

But undismayed, he has the skin drying with which he intends to make a belt, and the buttons rattle wherever he goes.

LONGLEAF PINE AND FIRE

Dr. Austin Cary of the United States Forest Service says in one of his contributions to the Naval Stores Review: "On longleaf, similar effects are to be expected as on slash pine, and the same too on larger trees than have thus far been dealt with. Several tests of the effect of defoliation by fire on growth were carried out in the Osceola National Forest last season and the results of the two will be put on record. Winter fire in longleaf is very common, run designedly oftentimes, and usually thought of as doing very little or no damage because very seldom are the trees killed. The following illustrates how growth for one year at least, is checked where they are defoliated:

"Trees between 25 and 30 feet in height, around 4 inches average in diameter, totally defoliated by a January fire grew .85 foot in the season on the average as against 2½ feet for similar unburned tree standing nearby; from June 16 to the close of the season diameter growth was 3 times as much on the unburned as the burned trees. Recovery of growth rate planned to be ascertained by later observations.

"Depression of the growth rate of timber through fire, especially of repeated fire, stands in the same relation to returns to be expected from timber growing as does poor soil, a matter covered in a preceding article."

"FORESTRY AN ECONOMIC CHALLENGE"

Arthur Newton Pack is the author of a valuable new contribution to forestry literature entitled "Forestry an Economic Challenge." The author is the director of the Charles Lathrop Pack Foundation, and an authority on both forestry and economics.

The treatment given by Mr. Pack is new in important particulars; old battle cries of the past are discredited, and a dispassionate and critical view of the destined role of forestry in the national program is presented. The MacMillan Company of New York is the publisher.

GEORGIA'S FORESTRY WORK EXCEEDS OTHER STATES

Quota of Men more than taken up and Enlisted from Other States Man some of the C. C. C. Camps

The thirty-five C. C. C. camps located in Georgia, 30 of which are directed by the State Forest Service and 5 by the U. S. Forest Service on the national forests, have called for more than the 6,000 quota of Georgia men. As a consequence, Georgia has four camps of the 30 directed by the State Forest Service manned by recruits from North Carolina and Alabama, which states have thus far been unable to absorb their allotment.

The Georgia Timber Protective Organization system has readily provided a basis for forestry camps for work in which federal, state and private land owners cooperate and private land owners are obligated to maintain and carry out plans for complete forest fire protection.

The Timber Protective Organization originating in Georgia has been very effective. It consists of a group of land owners forming an organization to prevent forest fires. The organization elects officers and uses methods recommended by the state forest service, and recommended by the U. S. Forest Service. Half of the expenses these organizations incur are paid from federal funds under the Clarke-McNary Act.

Some of these organizations have functioned 6 to 8 years. The older timber protective organizations have been given first consideration in the C. C. C. work and it is expected that all such organizations will receive benefits before the forestry relief work is ended.

COFFEE TREE OF SOUTH

The Coffee Tree of the southeastern United States has its only close relative in southeastern Asia, according to a statement made by the Alabama Commission of Forestry. The two species belong to the same genus and are hardly distinguishable from each other. It is perfectly evident that both descended from a common ancestor.

Since trees are not given to crossing oceans and establishing new colonies, it is clear that there was in ancient geological times a fairly connected forest growth extending between the two regions. These regions later became separated by the intervening of the seas which now lie between the continents. It is very probable that at one time the two species, or at least their common ancestor, existed through northwestern North America, the Arctic region and possibly Europe.

SUSTAINED YIELDS POLICY APPROVED

The National Lumber Association, at its recent annual meeting, received a message from President Roosevelt, through Secretary Wallace, in which it was stated that any code relating to the cutting of timber should contain "some definite provision for the control of destructive exploitation."

The association authorized its secretary to give assurance that its code of practices would include cutting policies and suggested that a conference be held with representatives of the U. S. Forest Service, state governments, Society of American Foresters, the American Forestry Association and other organizations "for the purpose of formulating a concerted and constructive program of public and industrial action providing sound forest management."

It was the sense of the meeting that permanent progress toward productive maintenance of private forests cannot be made without reform of confiscatory systems of taxation, and until forest industries are able to command capital and credit similar to other forms of agriculture.

It was asserted that forest industries have long strongly favored the introduction of sustained yield practices.

D. G. BICKERS, FRIEND OF FORESTRY PASSES

As editor of the Savannah News, Daniel G. Bickers did much to promote the cause of forestry in Georgia. Death removed him from his field of usefulness July 16.

Mr. Bickers was a man of versatile achievement, being reporter, editor and poet, in each achieving distinction. The State of Georgia has lost an outstanding genius and the cause of forestry an ardent and forceful advocate.

NAVAL STORES CODE COMPETITION RULES

At a recent meeting of producers of naval stores by the steam and solvent process held at Birmingham, Ala., for the purpose of forming an association and adopting a code of fair competition to apply to operations under the provisions of the National Recovery Act, a tentative constitution and set of rules was discussed and a committee appointed to bring the matter before the trade for permanent action in the near future.

Producers of gum turpentine and rosin have discussed proposals for similar action but it is contended that this branch of the industry comes under the provisions of the Agricultural Adjustment Act rather than the recovery measure and a movement has accordingly been started to formulate plans for co-operation with the Agricultural Department at Washington. At a

meeting held at Brunswick, Ga., a committee was appointed to make a study of the agricultural act and report to a gathering of producers to be held at a date not yet decided upon.

NAVAL STORES INDUSTRY PROFITS FROM RESEARCH

Turpentine and rosin producers in Georgia and the Southeastern States lost money for many years through inefficient stills, inaccurate grading, and through products damaged by rust. Improvements brought about, largely as a result of research of the United States Department of Agriculture, now make possible more efficient methods and better quality products.

Several years ago the Bureau of Chemistry and Soils developed a set of permanent rosin standards made of glass. Those formerly used were made of rosin, which bleached with age, and frequently caused misgrading. More recently the Bureau developed a new fire still which is more economical than the old type, and which produces better rosin. It has also demonstrated that it pays to use only rust-free equipment, as a mere trace of rust lowers the grade of rosin.

Department workers have developed a new practical and economical still for large operations which helps to cut down the cost of production. The department now collects and makes available to producers reliable statistics on the naval stores industry, and through cooperation with State agencies it makes available to producers the best production practices.

Rosin, tar, and turpentine came to be known as naval stores in the days of sailing vessels when pine tar was a necessary part of a ship's stores, as it was used for waterproofing sails and ropes, as well as the part of the ship below the water line. Although this use has largely disappeared and these pine-tree products have found increasing use in the paint, varnish, paper, and soap-making industries, the term naval stores still persists.

TO DOUBLE NATIONAL FORESTS AREA IN EAST

An order approved by the President of the United States calls for the purchase of 6,000,000 to 8,000,000 acres of timber and farm land in 20 eastern and southern states, at a cost of approximately \$20,000,000.

Forty-two areas have been designated by the United States Forest Service for purchase. In Georgia the purchases are for extending the areas of mountain lands already belonging to national parks.

The acquisition of the new areas will virtually double the acreage of national forests in the eastern half of the United States.

GEORGIA'S PROTECTED LAND INCREASES AREA RAPIDLY

Within the past two months the area of the forest land in timber protective organizations has increased rapidly, the added area being 1,364,000 acres. This came about largely by the expansion of the area of old timber protective organizations. Three new organizations, however, have been formed.

The fact that forestry work of the civilian conservation corps work can be done on organization areas of land sufficiently large to employ 200 men for six months, accounts for much of the interest in placing new lands within the timber protective organizations of the state.

All told, and including national forest land, there are now approximately 4 million of the 23,750,000 acres of timberland in Georgia under organized fire protection.

STEPHENS MEMORIAL PARK INCREASED IN SIZE

Through the generosity of people of Taliaferro county, and others interested in developing the Alexander Stephens Memorial Park at Crawfordville, an area of 174 acres of land has been added to the park.

At its recent quarterly meeting, the Commission of Forestry and Geological Development gratefully accepted this contribution to the state park system. One of the C. C. C. camps of 200 men has been located on the property to carry out plans for improvement and beautification.

When the present plans for repairing the Stephens home, restoring the grounds to the condition in which they were kept by Mr. Stephens, and converting the whole acquired area into a beautiful park, are completed, it is expected to attract many visitors who will not only enjoy the park, but honor the memory of a great southern leader.

VIRGINIA'S DEMONSTRATION FOREST

A forest of more than 3,000 acres, valued at \$200,000 has been bequeathed to the University of Virginia by Dr. Walter M. Seward of Brunswick County, Virginia, to be used for "practical demonstrations in the art of forestry". Funds are to be devoted to the maintenance and upbuilding of the school of forestry of the University of Virginia.

FARM TIMBER NEEDS

Sumter county, South Carolina, has been elected as one of twelve areas in the United States for a study of timber use on the farm. This is a part of a survey of the nation's timber resources and requirements, the farm being one of the principal consumers of forest products.

THE VANISHING GIANTS

The remainder of a race of giants making a last stand in the western part of the United States, is the Sequoias, or redwoods, mighty trees that remain from the age of dinosaurs to remind us that the largest and strongest must give way before changing conditions. A hundred million years ago they flourished generally all over the world—now a mere handful of them remain. They grow so tall that tradition tells that "it takes two men and a boy to look to the top of them," and that the age of some of the standing trees has been estimated at four to six thousand years. The tallest of the survivors is over 270 feet high, and is 37.3 feet in diameter at the base.

The Sequoia redwoods have been named for a famous member of a tribe of Indians, who also made a gallant fight against changing conditions. This was a Cherokee who spelled his name Se-quo-yah, who perfected a phonetic alphabet of 86 symbols with a character representing every sound in the tongue of his tribe. He did this despite his utter lack of formal education.

This alphabet has often been referred to as the greatest ever invented. It enabled every member of the tribe, within a few days after its acceptance by them, to read and write. It is said that a Cherokee child might learn to read and write the Cherokee language in a day, and contributed more than anything else to enable the tribe to make a winning fight against the inroads of civilization. The Cherokees established a printing press and with type made of the various symbols printed two newspapers daily. They have published their own laws and many other books, including the Gospels.—Service Letter (Pa.).

CAMP FIRE CARE: HELPFUL SUGGESTIONS

When camping, always carry a reserve supply of matches in a well-corked bottle or watertight can, says the United States Forest Service. When you are ready to start a camp fire, shovel away all ground litter within a radius of 3 to 5 feet of your fireplace. Do not under any circumstances place your fire within 10 feet of standing trees, or against fallen logs, or tree roots. Keep away from overhanging branches, and build your fire on an earth or rock foundation. Dig a small hole for the fire and place a rock on each side. A few iron rods about 3 feet long, to be laid across a fire to hold cooking utensils, are a useful addition to a camp outfit.

Cook over a small concentrated fire, burned down to a good bed of red coals. You might also carry one of the old-fashioned cast-iron Dutch ovens, or a 2-burner gasoline stove. You can make a small but efficient camp stove by filling a large coffee can half full of sand or earth and pouring in a cupful of gasoline. Punch 3 or 4

holes in the can just above the level of the sand. A cupful of gasoline will burn 40-50 minutes, enough to heat water or soup.

In wet weather you can probably find dry sticks for kindling among the small dead branches. Split it up and make kindling from the center. Another help in starting a camp fire is a tablespoonful or two of sawdust dampened with kerosene. A good axe and a shovel are necessities on any camping expedition.

Burn all papers and cartons in the camp fire, and when you leave, put the fire out by stirring water, and lots of it, into the ashes. Always be sure your fire is out—dead out—before you break camp.

FIRST DISTRICT

W. D. Young, District Forester
Rome

C. C. C. Activities

The Rome office has been the scene of much activity during the past month, in selecting camp sites and personnel for C. C. C. camps.

Three camps were approved for the Rome district, as follows: Project 58, Ellijay, Gilmer County; Project 77, Tate, Pickens County, and Project 80, Lookout Mountain, Chattooga, Walker and Dade counties. Active work has already begun at Camps 58 and 77.

Captain Thorn, camp commander, and his corps of officers and army personnel reached the camp site at Ellijay with 203 C. C. C. boys on July 24th. Work of setting up and getting camp in shape is completed and work will be under way in full capacity by the end of July.

Mr. C. M. Simmons, superintendent of forestry work at Ellijay, and his staff of foremen will carry out the program of projects outlined to take care of fire protection needs.

Lieutenant Griffin, camp commander of Project 77, and his staff of officers and army personnel, arrived at Tate, Ga., on July 21st, with 190 C. C. C. boys by special train over the Louisville and Nashville railroad. Trucks were provided to transport men to camp site 7 miles from Tate, Ga.

Mr. E. C. Perrow, superintendent of forestry work, and his staff of foremen are carrying out the program of projects outlined to take care of fire protection needs near Tate.

Major Francis Fuller and his staff of officers moved into camp on Lookout Mountain, near Menlo, Ga., on July 18th, with 190 World War veterans.

Mr. W. T. Ledbetter, Superintendent of forestry work, of this camp, with his staff of foremen, will carry out the fire protection measures outlined. Work in the field will get under way in full capacity by the end of July. This is one of the few camps

in the state where World War veterans are supplied as C. C. C. workers, and plans are being made to make this one of the most unique camps in the state.

SIXTH DISTRICT

Jack Thurmond, Dist. Forester
Savannah

Camps Manned in District 6

To date, there are four Emergency Conservation Work Camps established and manned in the Savannah district. Camp 53, at Hinesville, has been working in the woods since June 1st. Location of the camps in District 6 are as follows:

Camp 53, Hinesville, Ga.—Liberty County.

Camp 61, Soperton, Ga.—Treutlen County.

Camp 63, McRae, Ga.—Telfair County.

Camp 66, Brooklet, Ga.—Bulloch County.

Each camp has an enlisted personnel of two hundred men and the work in the woods is supervised by the camp superintendent and his foremen.

ECW Work in Liberty County

Pre-suppression and fire protection work is being carried on in Liberty county by men enrolled in the C. C. C. at Camp 53, and under the supervision of C. J. Martin, Camp Superintendent.

The work done to date consists of a complete map showing type, roads, trails and drainage on thirty thousand acres, twenty miles of truck trail, twelve miles of cleaned right of way for fire breaks and enough cy-press telephone poles to put up thirty miles of line. Right of way for twenty miles of telephone line has been cleared. The work will progress faster now since the men have a better idea of what is wanted and have also become hardened and are in better shape to stand the hot weather.

ASHE HERBARIUM

The University of North Carolina has acquired the William W. Ashe herbarium which will be available for reference this year.

As a forester and botanist Mr. Ashe published 510 new botanical names. He was a graduate of the University of North Carolina and joined the United States Forest Service in 1899, dying March, 1932.

Work With 4-H Club Camps

Extension Forester DuPre Barrett gave some time in July to displaying moving pictures and in teaching forestry to boys of the 4-H Clubs in various parts of north Georgia. The camps were in charge of County Agricultural Agents.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

PINE MOUNTAIN DISTRICT, GEORGIA

GEOFFREY W. CRICKMAY

Pine Mountain and its southern neighbor, Oak Mountain, together form an east-west trending belt of ridges, 65 miles in length, extending from Chattahoochee River to Barnesville, Lamar County, in western midland Georgia. The mountains are more or less sinuous ridges, in places sharp-crested, in places with broad flat tops, rising 100 to 500 feet above the relatively flat Greenville Plateau. South of Woodbury, Pine and Oak mountains meet in a complete loop known as the Cove. Here Flint River has cut a narrow steep-sided gorge through the range over 6 miles in length and from 300 to 400 feet in depth. West of Flint River in southern Meriwether County, Pine Mountain is broadly expanded and reaches its maximum altitude

of the mountain, are well known to everybody who has visited the area. It is the purpose of this article to present briefly some less well-known facts about Pine Mountain, particularly concerning its geology, the development of its scenery, and the nature and origin of Warm Springs.

The rocks of Pine Mountain district were deposited as sediments many millions of years ago (in a late pre-Cambrian period variously estimated by geologists as 250 to 500 million years old) in an interior sea in much the same way as sediments are deposited along the Atlantic coast at the present time. Originally these deposits consisted of layers of clay and sand lying in a horizontal position. However, after this primeval ocean had retreated from the

At a still later date the rocks were again subjected to compressive forces of the earth. This was the period of great mountain-making movements extending from Alabama to Nova Scotia which raised the Appalachian Mountains to their greatest prominence. In the Pine Mountain district the metamorphosed rocks were broken into blocks by fractures, or faults as they are called, and each block was shoved over its northern neighbor, as shown on the accompanying sketch. The movement of blocks along a fault is one cause of earthquakes. Along the Pine Mountain faults there has been movement of thousands of feet. Since the time when these faults ceased to be active, the Pine Mountain district has been worn down by continual erosion to relatively low hills, but its internal structure remains exceedingly complex, as complex indeed as portions of the Alps. All that is left is merely the "roots" of former alpine mountains.

The next event in the Pine Mountain district of which any record is left is a volcanic period represented today by dikes of dark basaltic rock. These dikes are prominent east of Raleigh, in the vicinity of Manchester, and north of Talbotton. In the northern Atlantic states great sheets of lava were poured out on the surface at this time (for example, the Palisades of Hudson River) so that, although no ancient volcanos or surface lavas are known in Georgia, it is not unreasonable to suppose that they once existed. This was the period of dinosaurs, great reptiles which, if not as ferociously agile as present day mammals, were at least more awful and terrifying in appearance. If the dinosaurs ever stalked their prey over Georgia hills they left no record of their coming or going.

Since this volcanic period the Pine Mountain district has undergone long and continued erosion. The schists are easily weathered and worn away so they have come to occupy the low ground. The quartzites are hard and resist decay so have been etched out in relief to form the ridges. Flint River is the only large stream to cross the mountain belt. In the six-mile gorge of this river it has cut its way through four quartzite ridges. It has chosen, in fact, probably the least advantageous route across the mountains on its course to the sea. The explanation for this anomalous condition appears to lie in the fact that the entire area was in ages past covered by the margin of the Atlantic ocean, and that a thin veneer of coastal plain sediments overlapped the mountain district. Then, as the shore line retreated towards its present position, Flint River took its course across the flat lying sediments but, as it wore its way down to the older solid rocks beneath, it found itself cutting down to, that is, superimposed on, the hidden quartzite barriers. Other streams may have had a similar history but

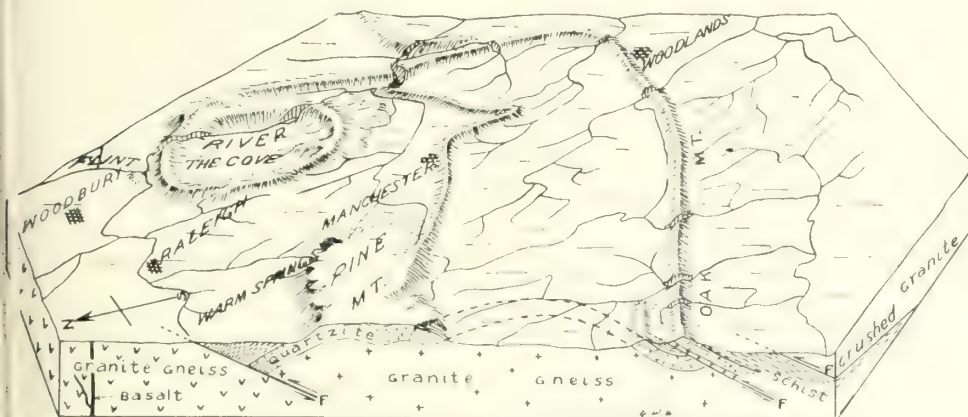


Fig. 1—Block diagram of Pine Mountain in vicinity of Warm Springs showing geological structure. Faults are marked F.

over 1300 feet. At the northern base of this expanded portion of the mountain lies Warm Springs, which, if not in a geographic sense, at least from a popular viewpoint, may be regarded as the center of the Pine Mountain district.

In actual dimensions Pine Mountain is diminutive beside the mountains of northern Georgia but in its setting on the flat plateau of the central counties, with its bold, steep-sided ridges, and particularly its thermal spring used for the treatment of infantile paralysis, the district has become a popular and nationally known resort. The superficial features of scenery, such as the mountain streams and waterfalls, the trees and wild flowers that cover the hills, the striking views from the crest

area and the rocks had become consolidated to shales and sandstones, severe earth movements occurred which buckled the strata into sharp folds. At this time molten rock from within the earth, mainly granite, was injected into the folded sediments. The heat of these intrusions and the pressure of the folding effected great changes in the chemical and mineralogical composition of the sediments. They were, so to speak, cooked in the granite "juices" under high pressure so that the shales were changed to a rock full of mica flakes known as mica schist, and the sandstones were changed to a massive quartz rock known as quartzite. This process of change is called metamorphism and the rocks produced are called metamorphic rocks.

only Flint River was large enough to maintain its course across the mountain belt. Since that time the coastal plain material has been entirely removed unless it is represented by the rounded boulders that one may find on the crest of some of these hills or by the bauxite and kaolin deposits that lie west of Warm Springs.

Pine Mountain is noted for its springs which occur in a zone along the northern base of the hills. There is White Sulphur Spring, Chalybeate Spring, Thundering Spring, Cold Spring and, most famous of all, Warm Spring. Cold Spring and Warm Spring are less than a mile apart yet there is a difference of approximately 25 degrees in the temperature of their waters. The total dissolved mineral content of Warm Spring is 123 parts in a million, whereas Cold Spring has but 23 parts in a million. The water of Cold Spring, flowing at the truly remarkable rate of nearly 3 million gallons a day, is utilized at the present time by a United States Fish Hatchery.

According to the report of S. W. McCallie, State Geologist, the water of Warm Springs has a temperature of 87 degrees F., which is approximately 25 degrees higher than the normal springs in the area. The flow of the spring is 1890 gallons, or 15,750 pounds of water a minute. From these figures McCallie has calculated that every minute 425,250 British Thermal Units (B. T. U.) would be expended in raising this amount of water to the observed temperature. This would require 30 pounds of coal a minute (rating the coal at 14,000 B. T. U.) or more than 20 tons every twenty-four hours. The water at Warm Springs, Georgia, brings to the surface in a given interval 1.3 times as many heat units as the 71 springs of Hot Springs, Arkansas.

The heat of Warm Spring is generally thought to have originated from the heat of the earth at depth, for the heat developed by friction during folding and faulting of the rocks, and the heat of the intruded granites and basaltic rocks has long ago been dissipated. As every miner knows, the temperature increases with depth within the earth. Scientists have estimated this increase to be 1 degree F. for every 25 to 130 feet of descent with a general average of 1 degree F. in 50 to 60 feet. In case the increase of temperature of the water from Warm Spring (25 degrees) is due alone to the depth of its origin, and estimating this rate of increase at 1 degree F. for every 60 feet, the approximate depth from which the water comes would be 1650 feet (deep mining operations extend to depths of more than 5000 feet; oil wells have been bored to more than 6000 feet). This calculation makes no allowance for the heat lost as the water works its way to the surface, so that actually the depth of origin is somewhat greater. The strongly fractured character of the rocks, which has resulted from faulting, facilitates the movement of

the water from this depth to the surface but it is not clear why, at this point alone, the heated waters appear as springs.

The story of Pine Mountain cannot be written in the brief space of this article, but it is hoped that in the light of what has been said the intelligent visitor to the district will view the scenery not as ready-made but as the product of ages. He may view that imposing trench which is Flint River gorge as the products of hundreds of thousands of years. He may see in Pine Mountain itself the results of erosion through ages past. Then he may turn to the basaltic dikes and picture a period millions of years ago when hot lavas worked their way to the surface. And he may regard the very foundations of the mountain on which he stands and know that he has passed back into a drear pre-Cambrian world existing not millions but probably hundreds of millions of years ago, a world populated by only the most lowly of living things but nevertheless characterized by floods and drought, by rain and sunshine, and by catastrophic earthquakes just as are portions of our present world.

FORESTRY ALMANAC

The "Forestry Almanac" of the American Tree Association, 1933 edition, is a valuable contribution to forestry information. It begins with a statement by Charles Lathrop Pack, president of the association. Then follows information about the United States Forest Service, its various divisions and activities; the United States Timber Conservation Board; forest inventory, Roosevelt on forestry, forest employment survey, demonstration forests, and a wide range of information about forestry activities of associations and states.

The publication is prized by all who are interested in promoting forestry, and to the American Tree Association a debt of gratitude is due for this splendid service.

C. C. C. Improves Lake Rabun Road

One of the most popular lake resorts in Georgia is Lake Rabun, owned by the Georgia Power Company and surrounded largely by the national forest. Camp 9-F, under the direction of the United States Forest Service, is improving the road bordering this lake, a work that is highly appreciated by the numerous motorists flocking to that area at the week-ends.

GULF-ATLANTIC CANAL

T. G. Woolford, president of the Georgia Forestry Association, is also president of the Georgia Canal Commission, promoting the plan to connect the Gulf of Mexico and the Atlantic ocean along the border of northern Florida and southern Georgia.

Mr. Woolford is giving much time at present to promoting the plans in the hopes of launching the undertaking as an employment measure of the federal government.

Harold Sebring Jr.

Born to Mr. and Mrs. Harold Sebring, July 24, a son, Harold, Jr. Mr. Sebring Senior is Assistant State Forester of Georgia with headquarters in Atlanta.

Camp Forestry Classes

At the 3-C Camp located at Albany, Superintendent Eitel Bauer, a highly trained forester, is giving classes in forestry. The boys are showing interest and are trying to find out what it is all about.

Mrs. M. E. Judd, Dalton, member of the Commission of Forestry and Geological Development of Georgia, has been given both state and national certificates of honor in Parent-Teacher Association work.

Poison Oak Remedy

Campers and workers in the woods are likely to get poisoned by poison oak or "poison ivy". A remedy that has proven effective is sweet oil.

FARMERS BENEFITED

BY C. C. C. CAMPS

Supplies for the 3-C camps are drawn largely from local sources. Vegetables, meats and fruits, grown by farmers in a wide radius of the camps, find ready sales. Bakeries of cities and towns are enjoying a prosperous business with the camps. Thus the farming interests are receiving benefit from the Emergency Relief Work represented by the forestry conservation activities.

COMMUNITY FOREST PARK

Through efforts of the club women in Bay Springs, Jasper County, Miss., there has been established a Community Forest Park. A tract of virgin timber has been deeded to them by the Gilchrist-Fordney Company. It contains an acre of beautiful longleaf virgin pine and is located on Highway 15, between Bay Springs and Laurel. The club women have erected a marker inscribed "Virgin Pine Reserve."

ROOSEVELT ORDERS TREES

President Roosevelt has ordered from the New York State Conservation Department 5,000 tulip-poplar seedlings and 1,000 balsam transplants for planting on his estate at Hyde Park, Dutchess County, N. Y.

If radio's slim fingers can pluck a melody
From night, and toss it over a continent o sea;
If the metallated white notes of a violin
Are blown across a mountain or a city din;
If songs, like crimson roses, are culled from
thin blue air—
Why should mortals wonder if God hears
prayer?
—Exchange

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THIRD VOCATIONAL FORESTRY SCHOOL CAMP INTERESTS 100 BOYS

**SCHOOL CAMP HELD JULY 24 TO AUGUST 12 AT CLARKESVILLE
A. & M. SCHOOL—FORTY-SIX RECEIVED CERTIFICATES OF VO-
CATIONAL FORESTER—EARNEST WORK, ATHLETICS, EXCUR-
SIONS, MOVING PICTURES, ENTERTAINING PROGRAMS FEAT-
URE SESSION—PERSONNEL OF STUDENT BODY VERY
HIGH ORDER**

The third annual three-weeks session of the Vocational Forestry School Camp came to a successful conclusion Friday night, August 11, at the Clarkesville Agricultural and Mechanical School. Forty-six young men who had attended two camp sessions received certificates of Vocational Forester after completing six weeks of intensive training in tree identification, silviculture, timber cruising, marketing and wood utilization, a course of work that qualifies the holders of certificates to do non-technical jobs in forestry.

The students were a select list of high school boys from Smith-Hughes rural high schools of the state who had studied forestry under vocational agricultural teachers and had practiced forestry on school forests and on home projects, and who had won camp scholarships in competitive forestry examinations, as well as for general scholarship and moral character. This select group of farm boys, intensely interested in forestry, made instruction a pleasure.

In all there were 99 students, 53 of whom were first year boys. They came from 50 counties of the state where rural consolidated schools are teaching vocational agriculture.

This year the camp has been conducted without the valued services of district foresters who were too heavily involved with U. C. C. camp work to be available. In their places the camp has been fortunate in securing the services of extension foresters and outstanding vocational teachers of the state. The staff was made up of Bonnell Stone, Oxford; DuPre Barrett, Athens; L. J. Cox, Epworth; T. G. Walters, Moultrie; Robert T. Grogan, Athens; I. V. Chandler, Nashville; W. B. Bates, Waresboro; Hoke Griffith, Oxford; J. H. Mitchell, Baldwin; C. O. Parker, Carnesville; Clovis Turk, Dale City and C. A. Whittle, Atlanta.

M. D. Mobley, Tifton, Assistant State

Supervisor of vocational agricultural teaching, has been a very successful camp manager for the three sessions of the camp.

About three-fourths of the time allotted to school work each day was devoted to work in the woods. In keeping with the system used in vocational work, the job method of teaching was used. Each student was required to do each job and convince the teacher that he knew how to do it.

An area of about 15 acres of woodland was laid out. Each of the second year students was required to survey the tract, make a topographic map of it on graph paper, using colors to show both physical features and forest types. They were required to identify every species of tree on the



**T. G. WALTERS, Moultrie High School
Winner in forestry work 1932-33**

plot, collect and mount leaf samples, giving both the common and scientific names. All timber above 10 inches in diameter on the area was cruised for an estimate of board feet and cordwood content. Plans for improving the forest were outlined by each student. Studies of harvesting, marketing and uses of wood were made.

While this intensive work for second year boys was going on, the first year boys were instructed on other areas along similar lines to familiarize them with the instruments to be used and the general principles of work to be done next year.

Every boy was interested and carried on the work assigned. There was plenty of work to do in the woods, in their classrooms and in their rooming quarters. But while there was plenty of work, there were opportunities for play. Under the able direction of C. O. Parker, of the staff, athletic contests were carried on between the first and second year boys. Baseball, tennis, swimming, relays, basketball and horse-shoe pitching were the principle athletic events.

Each Saturday, an excursion into the mountains was conducted. The first trip was made to the top of Blood Mountain and to Vogel Park. An afternoon was taken to visit Lake Burton, where swimming contests were conducted. The second Saturday excursion was to Tallulah Gorge, where the boys were privileged to inspect the wonderful power plant at that place. Numerous trips were made with teachers to identify trees and forest types.

Speakers Heard

During the camp session several speakers were heard. J. T. Wheeler, of the University of Georgia spoke on birds and their value. Mrs. M. E. Judd, Dalton, member of the Commission of Forestry and Geological Development, made an inspiring address on the requirements for success in life. Bonnell Stone, Oxford, spoke on the principles of success in forestry practices as developed in his experience of several years as a forester. G. D. Marckworth, head of the forestry school of the State College of Agriculture, gave an interesting address on forestry education and the outlook for forestry. C. N. Elliott, district forester, Augusta, spoke on U. C. C. camp work in an interesting and informative address and pepped up the camp with his inspiring long leadership. C. A. Whittle, Education-

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Extension Foresters

Bonnell Stone, Chairman. Oxford
Dupre Barrett. Athens
K. S. Trowbridge. Tifton

al Manager of the Georgia Forest Service, spoke on plans for a permanent camp for vocational forestry students.

L. M. Sheffer, State Supervisor of Agricultural Education gave an encouraging talk to camp boys on the significance of the forestry project.

Paul Chapman, director of vocational teaching in Georgia, gave his experience on a hunting trip in the Maine woods, and closed with inspiring words about the vocational forestry work.

The speakers at the closing session of the school camp were State Forester B. M. Lufburrow and Dr. Charles H. Herty, in charge of pulp and paper research of the Department of Forestry and Geological Development.

Mr. Lufburrow spoke on the development of the vocational forestry idea in Georgia, of how it had attained national interest, and of his expectation of having the vocational forestry camp in permanent headquarters within another year. Mr. Lufburrow expressed keen interest in the school and told of employing a number of boys who received certificates last year as foremen in the C. C. C. camps where they were making good records.

Dr. Charles H. Herty told of the progress



Young men who won certificate of Vocational Forester at
Vocational Forestry Camp 1933

of research work in the use of southern woods for making white newsprint paper, since he addressed the camp a year ago. He referred to how to avoid difficulties from blue stain by using fresh-cut wood; of how it was found that young pines can be ground without the pitch troubles encountered in grinding red spruce; of tests showing that pine pulp makes a white, smooth paper, taking ink of type and illustrations equal to any pulp paper, and of the pine paper meeting tensile tests of high powered presses. His remarks were heard with intense interest.

Awards

During the closing exercises, the award to the vocational agricultural teacher doing the best work on the forestry project for the school year 1932-33 was given to T. G. Walters, Moultrie. A review of his work appears elsewhere in this issue. He was given a certificate of honor and a cash prize.

The Herty prizes of \$50 and \$25 to students doing the best work in promoting interest in forestry in their communities were awarded as follows: First prize, Herman Braddy, Pavo; second prize, Ulysses Carlan, Commerce. Honorable mention was given to Eugene Adams, Moultrie, as a close third. A review of work done by these leading contestants appears elsewhere in this issue.

In determining the highest grades obtained by students in two summer camp courses, the records revealed three students very close together. The leader was Herman Braddy, Pavo. The three leaders in their order were as follows:

Herman Braddy, Pavo, 94.55
Ulysses Carlan, Commerce, 94.30
Eugene Adams, Moultrie, 94.07

The class representative to speak at the closing exercises was Lee Roy Thomas, of Pelham. He spoke briefly, but eloquently of the vocational forestry idea and pledged his class to sustained interest in promot-

ing the cause of forestry.

A prize of a book on forestry, offered by Bonnell Stone to the boy writing the best statement of the things about the camp he liked best was won by Chas. Smoak, Jr., of Griffin, and was presented by Mr. Stone.

Certificates Given

Upon recommendation of C. A. Whittle, Educational Manager of the Georgia Forest Service, a certificate of Vocational Forester was given by State Forester B. M. Lufburrow to each of the following: John Wesley Alston, Preston; Eugene Adams, Norman Park; Herman Braddy, Pavo; Carson Britt, Lawrenceville; Parker Bedingfield, Cadwell; J. W. Butler, Calhoun; John Bond, Dalton; J. D. Cowart, Epworth; Bill Crosby, Sale City; Ulysses Carlan, Commerce; James Cochran, Lavonia; Truitt Drake, Adrian; J. C. Davis, Commerce; Willard Fain, Ellijay; Delmas Galbreath, Vidalia; Hugh Gillis, Soperton; Benjamin Gay, Madison; W. O. Hudson, Jr., Elberton; Theo Hughes, Dougherty; Elmer Hendrix, Gore; T. W. Jones, Omega; Champ Jackson, Winder; Edgar Kellar, Eastanollee; Etheridge Keith, Chamblee; Elmer Larsen, Leslie; Sim Lynn, Washington; Grady Lumpkin, Clarksville; Floyd Morgan, Screven; Quinton Mathis, Adel; Harold Morris, Carrollton; Charles Mathis, Lumpkin; Clinton Milburn, Wrens; John Everett Noland, Walker Park; Grady Pittard, Winterville; Frank Proctor, Brooklet; Lake Poteete, Kennesaw; Jack Paul, Sylvester; Cecil Parks, Howard; Charles M. Smoak, Griffin; Marvin Stephens, Fairburn; Tim Stafford, Claxton; Lee Roy Thomas, Pelham; Bill Warren, Dublin; Lewis Weaver, Hogansville; James Gillespie, Carnesville.

Join Georgia Forestry Association

The boys having made application as Vocational Forestry club for associate membership in the Georgia Forestry Association, the application was accepted with

dues by Bonnell Stone, secretary of the association, who declared the boys who had received certificates were junior or associate members of the Georgia Forestry Association.

Thus closed the third and most successful school camp for vocational forestry students of Georgia.

CAMP NOTES

Bonnell Stone was chosen class adviser of the second-year forestry group.

The singing at the camp was fine. DuPre Barrett and M. D. Mobley spelled each other as song leaders, and in the absence of Charles Elliott, Mary Mobley, the charming mascot of the camp was official leader of the "Woodsmen" song.

Stunt night was a great event. Songs, recitations, skits and athletic stunts, all by the students, proved highly entertaining. The "Silver Spoon Orchestra" consisting of Bill Crosby, Lee Sisson and Lee Roy Thomas proved a hit, as did the one-man orchestra, Harold English, with guitar and harp.

Miss Ola Ray, of Clarkesville, performed at the piano in a most acceptable manner and proved a favorite of the camp. Mr. Hu Inglis, pinch hitting for Miss Ray, was also a popular member of the camp.

The unofficial square dances on two evenings of the camp afforded highly enjoyable entertainment for a number of students and girls of the community.

To John Noland belongs the honor of climbing Blood Mountain three times in rapid succession — one being to get his shirt.

Speaking of shirts, a number of the boys discarded them on fields trips and went nude from the waist up.

One of the gamest of the bunch was Lee Sisson of Wilkes county who pitched ball for the glory of the camp against the Clarkesville team a week after breaking two ribs on the side of his pitching arm.

The second year boys hazed the first year boys, the order being that the first year boys run the gauntlet under a barrage of belt straps.

On the trip from Blood Mountain, the Indian mounds of Nacoochee valley were visited. The stunt of having one run around the mound, saying "What are you doing in there", with the assurance that on the third round they would hear "nothing" as an answer, was pulled. Of course nothing was the answer.

Someone attached a "whiz bang" to DuPre Barrett's car, which duly went off with a bang and released a cloud of smoke as if the car were on fire. Great excitement and laughter resulted as the whole camp bunch, ready to leave on an excursion, stood by.

Governor Eugene Talmadge thought so well of the camp that he signed the certificates in person instead of delegating this to a secretary, as often occurs in executive acts.



ABOVE—Group of entire attendants at Vocational Forestry Camp, faculty, students, and wives and children of faculty members.



LEFT—Members of faculty, wives and children.—In front Billy Bates and Mary Mobley. Front row, seated, R. T. Grogan, Miss Emma Griffith, Mrs. W. B. Bates, Mrs. Hoke Griffith, Bonnell Stone, Mrs. J. H. Mitchell, Mrs. M. D. Mobley. Standing—C. A. Whittle, T. G. Walters, I. V. Chandler, W. B. Bates, Hoke Griffith, L. E. Cox, J. H. Mitchell, DuPre Barrett, M. D. Mobley.

Some of the boys apparently thought grapes on the farm were public property. A word of caution was so effective that Mr. Hatfield, custodian of the college property, sent the boys baskets of grapes as an expression of appreciation.

On the opening night of the camp, nine district winners in speaking contests had their state contest at Clarkesville and the entire camp personnel turned out. It so happened that Elmon Vickers, Moultrie, one of the vocational forestry camp boys, won first prize.

O. M. Cates, Jr., of Meigs, Ga., elected himself camp correspondent and did some excellent reporting for the newspapers.

Some of the nicknames acquired at the camp are "Porcupine", "Coca Cola", "Slim", "Wormy", "Jaybird", "Snaky", "Bing".

The students of the camp passed a resolution asking the Georgia Power Company for a permanent camp site on upper Lake Rabun. The results were favorable, but the term of the lease was not sufficiently long to justify the erection of camp quarters.

A delegation of winners in forestry projects in vocational agricultural schools of Florida, who won trips through southern mountains, visited the camp and were much impressed with the work the Georgia boys were doing. William Jacobs, assistant district forester, Tallahassee, was in charge of the Florida group.

Several students, lacking funds to cover transportation costs, hitch hiked to camp. Charles Gunn, Byromville, reported 25 cents expense, 10 cents of which was chargeable to Atlanta street cars. Thumbing his way in Atlanta was ineffective.

PAPER MAKING WASPS

The earliest paper makers were the wasps. For their nests the wasps use wood fibers which they have chewed into a pulp and which they glaze on the outer surface.

According to a statement made in "Personality of Insects", each wasp goes off alone to hunt her materials, coming back to the nest with a wad of pulp held tight in her grasp. This is applied against the outer wall in a ribbon-like form, the creature using her jaws and legs as a rolling mill to reduce it to a required thinness. At last there remains out to glaze it over with her tongue that it may be waterproof.

One wasp may attack a white birch, another a green poplar, each wood contributing a different color or stripe around the nest. It is not unusual for many different colored stripes to be seen in their paper, each one of which will blend artistically with its neighbor.

T. G. WALTERS, MOULTRIE, OUTSTANDING IN FORESTRY

First Among Georgia's Agricultural Vocation Teachers for Excellence in Conducting School Forestry Instruction — P. L. Elkins, Alpharetta, Second — Awards Presented at Forestry Camp

For outstanding work among agricultural vocation teachers of Georgia, in presenting the subject of forestry in school and community for the year 1932-33, T. G. Walters, Moultrie High School, won a certificate of honor and a cash prize of \$75. These awards were announced at the closing exercises of the third Vocational Forestry Camp held at Clarkesville, August 11th.

The teacher rated as doing the next best work in the state for the school year is P. L. Elkins, agricultural vocation teacher at Alpharetta High School in Fulton county.

Professor Walters' record embraces teaching 12 jobs in forestry to students; gathering tree seed and successfully operating a seed bed of 320 square feet, planting 18,325 tree seedlings on school forest and on students' home project areas.

He had 38 students studying forestry, 35 of whom had home forest projects. He devoted 150 hours to forestry instruction. Fire lines around the school forest were renewed; growth measurements were made on burned and unburned land; 10 pounds of pine seed and 15 pounds of yellow poplar were gathered.

The school has erected a log cabin in the school forest where club meetings, barbecues, etc., are held. Improvements were made on the building and on the driveways during the year.

The boys gathered 50 kinds of wood in the county for a permanent exhibit. The 35 boys having home forestry projects planted 17,555 slash and longleaf pines. Eight of these boys had tree seed beds.

Mr. Walters presented forestry to adult evening classes attended by 150. He discussed forestry before future farmers organizations. A forest fire survey was made for the greater part of Colquitt county; over 200 column inches on forestry have been written for newspapers.

Moving pictures on forestry were obtained and displayed by Professor Walters to over 500 people in the county. Exhibits were made at Moultrie of pulp, paper and woods. A delegation, headed by Professor Walters, attended the annual meeting of the Georgia Forestry Association at Savannah. Numerous requests for forestry information have been answered.

P. L. Elkins' Record

The record of P. L. Elkins, vocation agricultural teacher at Alpharetta High School, where he has been teaching for only one year, and where forestry had not been previously taught, includes a wide range of activities.

The number of students taking forestry was 55. As much as 250 hours were given to forestry work. Six night classes of adults dealt with forestry subjects, each meeting averaging 30 in attendance. His school harvested 19 pounds of loblolly pine seed and 45 pounds of yellow poplar seed, a part of which was sold to create a school thrift fund. Enough seed were retained to plant a bed 5 by 120 feet to loblolly pine and another bed 5 by 40 feet to yellow poplar.

The school forest was thinned, converting the cut timber into 12 cords of stove wood that sold at \$4 a cord, which returns were deposited with the thrift club.

Using money of the thrift club, Professor Elkins financed a trip for 25 boys to Savannah to attend the meeting of the Georgia Forestry Association, enjoy the bicentennial celebration, see the ocean and study south Georgia forests.

Professor Elkins conducted a drive to get a large percentage of land owners in old Milton county to join the Forest Fire Fighters for the control and suppression of forest fires, being aided by students, each of whom obtained one or two members.

Forest fire fighting equipment was purchased and used as teaching equipment. A large school forest sign and several small ones were made in the school shop. Samples of various Georgia woods were installed in the shop. The Alpharetta school planted 1200 trees in open places, and also planted roadsides and school grounds with trees and shrubs.

The school forest which immediately adjoins the school and consists of a beautiful stand of pines has been pruned of dead limbs and undergrowth and put into a park-like condition.

STUDENTS' APPRECIATION

The Vocational Forestry Camp has meant more to me morally, mentally, and physically than I can express. I don't know of any other way the State Forest Service could render any more useful service than to educate this ambitious group of boys that gathers each summer at the camp, to appreciate and preserve our present forest resources.

I heartily join with many others in thanking and praising the Georgia Forest Service for this wonderful work and in the future will do all in my power to make the camp continue to be a shining success.

—Ulysses Carlan.

I enjoyed the camp and I will always remember the two summers as a time that I met, worked and played with the most select group of boys in this great state of ours. It was the happiest moment of my life when I received the Vocational Foresters Certificate. It was a time that I have looked forward to for nearly three years.

I will always remember the originators and leaders of these camps as the most select group of men and women in the state. I consider it a distinct honor and the greatest privilege that I have ever had to be a graduate of the 1933 Vocational Forestry Camp at Clarkesville, Ga.

—Herman A. Braddy.

SOUTHERN PINE USED IN TALLEST WOOD STRUCTURE

Wood has proven better than steel for radio broadcasting towers. The German government has erected a radio tower 450 feet high near Breslaw, the highest wooden structure in the world. It is 72 feet square at the base and about seven feet at the top.

German engineers hunted the world over for the best wood to use and selected southern pine as the best. The strength, rosin content that acts as a preservative, its comparative freedom from checking, splitting and shrinkage, and its long dimensions were among the factors leading to the acceptance of southern pine.

RAPID GROWTH OF WHITE PINE ON POOR UPLAND

Donald Young in Forest Worker tells of thinning and pruning operations on a forest of white pine planted on Laurel Branch, Macon county, North Carolina on the Nantahala National Forest. The site is 3,000 feet above the sea level, the soil a poor sandy clay loam underlain by granite and somewhat eroded.

In 1932 the largest tree was 8 inches in diameter and 45 feet high. The greatest height measurement between whorls was 4.2 feet.

The forest was thinned in 1932, the stand being 680 trees per acre was reduced to 523 per acre. The thinnings were sold at the stump for house logs and rafters in the town of Highlands, N. C., at an average of 50 cents per tree.

The remaining trees were pruned 6 to 20 feet up the stems. In three years another thinning is intended. Through removals by thinning a gross income of \$100 per acre is anticipated with 300 trees per acre remaining for final crop and increased income.

RECLAIMING GULLIED LANDS

In Farmers Bulletin 1697, W. E. Mattoon of the United States Forest Service, tells how trees, vines and grasses may be used to bind the soil and check erosion. The greatest need for planting natural oil binders in the south, he says, is on eroded and abandoned farm lands.

The author mentions the use of black locust, pines and cottonwood trees, honey-suckle and kudzu vines, and Bermuda and spedeza grasses for checking erosion. Theulletin carries information that concerns vast acreage of Georgia land.

HERMAN BRADDY, PAVO, WINNER HERTY PRIZE

Braddy High Man in Scholarship— Ulysses Carlan, Commerce, second Herty Prize, Second in Scholarship—Awards Announced at Third Vocational Forestry Camp.

Herman Braddy, Pavo, won the first prize of \$50 offered by Dr. Charles H. Herty, Savannah, for creating greatest community interest in forestry. The second prize of \$25 went to Ulysses Carlan, Commerce. Braddy also won the highest average grade in six weeks of the vocational forestry school with a grade of 94.55, while Ulysses Carlan was second with a grade of 94.30. A close third in the contest for Herty prizes and in scholarship was Eugene Adams, of Moultrie.

The high points in the record of Herman



Herman A. Braddy, Pavo, winner first Herty prize and honor student in scholarship.

Braddy in winning first prize of the Herty award are as follows: He organized a boys forestry club which issued a special forestry edition of the Pavo News printed on paper made by the state pulp and paper laboratory at Savannah from Georgia pines. The club broadcast a forestry program over the Thomasville radio station; planted a large number of trees on farms represented by the club membership; established firebreaks on farm lands; made a forestry exhibit at local fairs; secured signatures of parents of school children to prevent fires and cooperate in helping each other to fight fires. Between 4,000 and 5,000 acres were involved.

He won a prize from Holland magazine for the best article on forestry. He made permanent signs directing to the school forest, conducted a home forestry project; helped to conduct adult night classes in

forestry; attended the annual meeting of the Georgia Forestry Association at Savannah.

Carlan's Record

The activities of Ulysses Carlan, Commerce, centered largely on the Arp Forestry Club, organized by him in the Arp Schoolhouse, the preamble of the constitution being as follows: "We, the members of the Arp Forestry Club, in order to create interest and promote the study of forestry, secure the benefits of recreation and foster a love of nature for ourselves, do establish this constitution for the Arp Forestry Club."

Ten boys constituted the charter membership to which were added 22 others. Strict rules governed the conduct of the club and earnest work was given to practical phases of forestry such as fire protection, marketing timber, thinning, preserving timber, timber estimating, some phase of practical forestry being taken up at each regular meeting on the first and third Wednesdays of each month.

Carlan made talks on forestry and conducted demonstrations in planting, thinning, tree identification, etc. A debate was conducted on the subject: Resolved that 50 per cent of the land not producing timber should be producing timber.

The club planted 1,000 loblolly pines on its project of 25 acres. Some of the subjects discussed at the meeting created so much interest that the sessions were prolonged to two hours with ten minutes intermission. Tests were given and grades recorded. Dues of 10 cents each meeting were collected to pay the expense of a trip to the mountains to study the forests of that region.

Carlan not only conducted the club activities, but made talks to other schools; wrote numerous articles on forestry for the press; did much work on school forestry projects for Commerce High School; gathered tree seed; conducted a home forestry project and advised many land owners as to forestry practices.

Adams' Record

Eugene Adams, Moultrie, planted 1,050 pine seedlings, built firebreaks on his home project; gathered pine seed and established a small tree nursery; fought forest fires; conducted demonstration thinnings; wrote 85 column inches about forestry for newspapers; addressed local gatherings on forest fire protection; addressed the Georgia Forestry Association at Savannah on "Why Forestry Appeals to the Vocational Agricultural Student".

Adams helped put up a forestry exhibit and talked to about 200 people about the possibilities of making paper from Georgia pines. He has conferred with many land owners about thinning, planting and firebreak construction. His average grade for two camp sessions was 94.00.

Other students deserving favorable mention are: Delmas Galbreath, Vidalia; Oswald Smith, Waresboro; Eugene English, Clarkesville; I. J. Medders, Vidalia.

ATHLETICS POPULAR AT FORESTRY CAMP

Ninety-Five Per Cent of Students at Vocational Forestry Camp Participated in Some Form of Athletics—Second Year Group Won Honors

Ninety-five per cent of the students attending the Vocational Forestry School Camp, participated in some form of athletics. Much credit for arranging and carrying out the schedule of athletics is due C. O. Parker, Carnesville, who was in charge of athletic activities. He not only knows all forms of sports but has the happy faculty of enlisting boys and spurring their competitive spirit. He was a favorite member of the staff.

Among the sports at camp were baseball, swimming, basketball, cross country relay, tennis and horse shoe pitching.

In baseball the first game was won by the first year boys 9 to 6, but the two subsequent games were won by second year boys 18 to 1 and 18 to 8.

In the swimming contest the first year men won by a score of 19 to 15. In basketball the second year team won 14 to 11 and 28 to 17.

The cross country relay race of 5 1/2 miles was won by second year boys in 24 minutes.

In tennis matches Gillespie, second year man, won first place. The doubles were taken by Morris and Gillespie, second year boys.

The horse shoe pitching contest was won by Parks and Hudson, second year men.

The second year men were winners in total points by a large margin, the score being 25 to 5.

DISTRICT TWO

Everett B. Stone, Jr., Dist.
Forester
Gainesville

Camp Personnel Changes

Lieutenant R. T. Whitney, Jackson County Camp, has been transferred to Enotah camp No. 55 as commanding officer to take the place of Captain Rickermore who has gone to Raleigh to assume duties there. Dr. Serocci, who has charge of the Blairsville and Hiawassee camps, has been reassigned to the federal camp at Tree, Georgia.

Camp No. 55, Union County

Blood Mountain trail which runs from Vogel State Park at Neels Gap through Slaughter Gap to the top of Blood Mountain, has been rebuilt and widened and is now practically finished. To visitors at the gap it offers a wonderful hike and a view in every direction that is awe inspiring.

Mr. Baskin and his staff of foremen have made excellent progress in their work on

the Vogel State Park. Due to their efforts and the natural beauty of this site, this place will soon be one of the most beautiful state parks in the South. Mr. Baskin has many other projects such as road and trail construction, building of telephone lines and lookout towers, removal of fire hazards, etc., now well underway.

Camp No. 73, Towns County

This camp site located in the heart of the mountains of North Georgia is said "by authorities higher up" to be the most beautiful and ideally located camp in the East. Work, under the supervision of Mr. C. J. Oliver, on the many projects is coming along nicely. Foot trails have been built to the most advantageous lookout points. These with the truck trail roads will soon make this area readily accessible to the fire fighters who will be ready at all times to go at the word, and when a bunch of these young, broad-shouldered bronzed men of the 3 C camps once get to a fire "it won't be long then".

Camp No. 51, Indian Springs, Ga.

Work at the Indian Springs State Park, under the supervision of Mr. Blanton Clements and his corps of foremen, is running full strength. The work at this Park is progressing very fast, and in the near future it is due to be one of the show places of the entire South.

Camp No. 69, Commerce, Ga.

Work on private lands building roads, trails, and in forest fire prevention, is progressing nicely. This camp will operate on forest lands owned by the Chicopee Mills, which is the most ideal mill village in the United States.

Camp No. 79, Cornelia, Ga.

The forest work at this camp includes 6,000 acres of fine forest land on the Hunt estate, owned by the University of Georgia, in addition to many thousands of acres of private land. This camp is situated just above Cornelia, Ga. It is readily accessible and is an ideal site with a fine view of the Blue Ridge mountains.

DISTRICT THREE

C. N. Elliott, District Forester
Augusta

Alexander Stephens Slave

Cyrus Stephens, who was once a slave of Alexander H. Stephens, still lives in Crawfordville. Uncle Cyrus, who is 89 years old, lives with his wife, Alcora, on a little hill overlooking the "Big House", where his old "Marster" once lived. The little cottage in which Uncle Cyrus is spending his last days is humble and vine clad, and he no longer knows the splendor he knew in other days, but he sits and smokes and awaits the hour when he shall see and serve the great Stephens again.

Steps will be taken whereby Uncle Cyrus can be moved back to the "home place" as an attraction to visitors who will visit the Alexander Stephens Memorial Park.

Gwinn-Nixon State Forest

Work has begun on the Gwinn-Nixon State Forest. This work is being done by the CCC camp No. 57, located in Burke county. The program calls for permanent fire breaks surrounding the property drainage of the low areas in the forest thinning and planting. An effort will be made to make the Gwinn-Nixon State Forest an ideal forest area.

CCC Camp 74 Pets

The pets of Superintendent Thompson's Camp 74, in Stephens county, include 4 hound dogs, 2 pigs, a pair of bantam chickens, a calf and 2 rattlesnakes. We are waiting to see what new addition to the menagerie will be made.

Additional Acreage

Since the beginning of the ECW program, approximately 250,000 acres have been added to the TPO areas of District 3. Land owners are awakening to the importance of forest fire protection.

DISTRICT SIX

Jack Thurmond, District Forester
Savannah

Work Progressing at P-53

Since the members of the Civilian Conservation Corps moved into camp at Hinesville, Liberty county, on June 1st, considerable work has been accomplished.

Of course, the first few weeks were spent in getting the camp straight and living quarters established, then work in the woods started. To date, the various crews have finished twenty miles of truck trail, swamped and stumped twenty-two miles of fire break, cleaned out right of way for thirty miles of telephone line, cut, peeled and distributed five hundred cypress telephone poles.

The surveying crews have mapped some thirty-nine thousand acres in detail and are now busy on another ten thousand acre block. They keep the mapping ahead of the fire break crews, as the truck trails and fire breaks are first plotted on the map and then worked out in the field.

It was quite a problem in finding gravel to use in building the foundations for the towers, so a little prospecting was done and a gravel deposit located. The tower crew constructed a short road to the deposit, and are now hauling gravel to the three tower sites which have been located and cleaned out. The only thing needed now is tower steel, as all the preliminary work has been finished. Since a tractor and plow have been received, still better progress can be made.

Camp P-63 Manned by Veterans

The personnel of Camp 63 at McRae, Telfair county, Georgia, is composed of World War Veterans, who moved in during the latter part of July. They are busy finishing camp construction and have sent one or two crews to the woods for the

(Continued on Page 8, Col. 2)

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

MICA IN GEORGIA

by

Richard W. Smith, Assist. State Geologist

Mica or isinglass is one of the best known minerals in Georgia because of its bright and shiny appearance and widespread occurrence. The common varieties of mica in Georgia are **biotite**, or black mica, and **muscovite**, or white mica. The

trical industry as an insulating material. Washers, disks, and other shapes are stamped from the smaller sizes. The larger sizes are cut into various patterns such as those on which the heating wires of electric flat irons are wound. Hollow tubes for insulating wires are built up from washers or by rolling thin splittings using shellac as a bond. Some mica is still used for stove windows. The value of mica for these uses

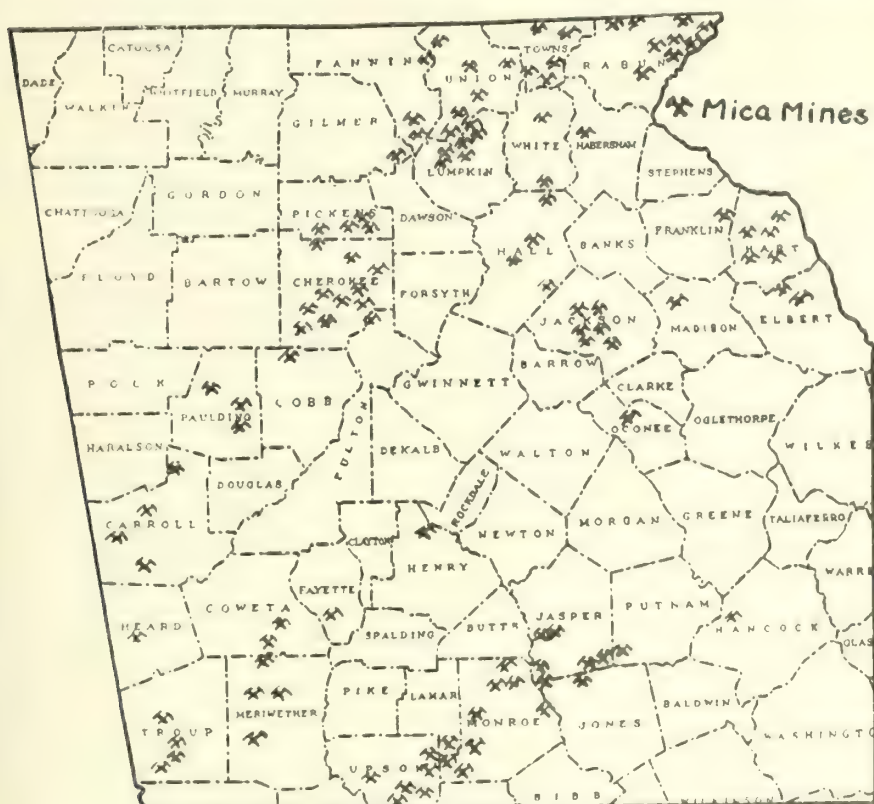
ites are largely made up of the same minerals that are found in granite—quartz, feldspar, and mica—but usually in very large, rather than small, crystals. They are probably the result of one of the final phases of a nearby intrusion of granite. The pegmatites, in addition to quartz, feldspar and mica, often contain comparatively rare minerals such as tourmaline, beryl, apatite, columbite, tantalite, rutile, and the radio-active minerals, some of which are also of commercial value.

Pegmatites vary in width from a few inches to several hundred feet, and in length from a few feet to several miles. Those of Georgia are ordinarily in the form of steeply inclined or nearly vertical vein-like bodies; but sometimes are irregular in form, appearing as lenses, chimneys, or irregular masses. Branching and sudden swelling and pinching are common. The size of the crystals and the distribution of the various minerals is very irregular. Feldspar is the most common mineral and often makes up 50 to 80 per cent of the rock mass. The feldspar near the surface has often been weathered to kaolin, a soft white clay. Quartz, the second most common mineral, is found in small pieces throughout much of the feldspar or its resulting kaolin, and in irregular masses, often in the middle or along the sides of the dike. The blocks of mica may be scattered throughout the pegmatite, but have a tendency to concentrate near the quartz masses and near the borders of the pegmatite.

Large blocks of mica do not necessarily mean large sheets of clear, flat commercial mica. The sheets are often streaked or spotted with a thin coating of magnetic iron oxide which cuts down their transparency and reduces their resistance to electric currents. Pressure and movement during and after crystallization often result in imperfect blocks. In some cases the sheets have been distorted so as to be wavy or twisted, in others they have been cut or "ruled" into narrow strips. Often the blocks are wedge-shaped and are made up of small overlapping sheets, a type known as "A-mica."

Mica mining is therefore unusually risky because of the possibilities that the size of the vein, the mica content, or the size and quality of the individual mica crystals may diminish to unprofitable proportions with little or no warning.

Sheet mica is found in the Piedmont Plateau and mountain sections of north Georgia. It was first mined by the Indians or the Mound Builders who used it for ornaments and looking glasses. The early white settlers knew of the mica deposits and perhaps occasionally dug out sheets for glazing the few windows in the more primitive cabins, but it was many years before they were commercially mined. Several mines were opened in the mountains of north Georgia between 1880 and 1885 and furnished large sheets of mica for glazing



Map of north Georgia showing location of principal mica mines.

latter is the only one of commercial value and is the one commonly referred to when the word "mica" is used alone.

Crystals of muscovite mica vary in size from tiny flakes to plates or blocks over a foot across. These plates, if no thinner than cardboard, are colored varying shades of green, amber, or reddish-brown. They may be split and re-split, however, into transparent and colorless sheets which are less than a thousandth of an inch in thickness, yet so strong and flexible that they may be bent nearly double. These properties of mica, that is, its ability to split into thin flexible transparent sheets, together with its resistance to heat and to the passage of an electric current, make the larger sheets of commercial value.

Sheet mica is used mainly by the elec-

trical industry as an insulating material. The waste from trimming the sheet mica and the blocks of mica that will not split into flat sheets is ground into sizes varying from "bran" mica to a powder so fine that it will pass a screen having 200 wires per inch. This ground mica is used in great quantities in a variety of uses, such as in the manufacture of artificial roofing to prevent the surfaces from sticking, to impart lustre to certain wall papers and paints, as a filler in the manufacture of soft rubber goods, to dust automobile tires to prevent them from sticking to the molds in which they are finished, and as the familiar Christmas tree "snow."

Sheet mica of commercial size is found only in pegmatite veins or dikes. Pegma-

tes are largely made up of the same minerals that are found in granite—quartz, feldspar, and mica—but usually in very large, rather than small, crystals. They are probably the result of one of the final phases of a nearby intrusion of granite. The pegmatites, in addition to quartz, feldspar and mica, often contain comparatively rare minerals such as tourmaline, beryl, apatite, columbite, tantalite, rutile, and the radio-active minerals, some of which are also of commercial value.

stove windows. The industry declined with the importation of mica from India, in spite of a growing demand for mica as an insulator in the electrical industry. Under a protective tariff considerable mica was mined in Georgia from 1900 to 1907, but following the panic of 1907 practically none was mined until 1914.

The wartime demand for domestic mica resulted in prospecting all over middle and north Georgia. The height of the mining took place in 1918, when 208,200 pounds of sheet mica and 40 tons of scrap mica with a total value of \$80,050 were reported. Since that time the demand for and price of domestic mica has greatly declined, and with it the mining of mica in Georgia.

Much of the mica mining in Georgia was done by men with no capital or knowledge of the proper mining methods. These men "ground-hogged" their way down, skimming out the cream of the sheet mica and wasting the smaller sizes and scrap mica. As soon as the sides of the untimbered pit started to cave in or they struck water or hard rock, off they went to another outcrop, too often neglecting to pay the owner his promised royalty. Such methods leave the surface so disturbed that future mining is much more expensive than it should be. The proper methods, while requiring some outlay at the beginning of the mining, would have resulted in the recovery of all the available mica at a minimum cost.

Mica mining is at best a considerable gamble and should be undertaken only by an experienced miner. The miner can seldom afford to buy the property outright, but must lease the mineral rights on a royalty basis. The common royalty paid by a mica miner to the property owner is one-sixth, one-eighth, or one-tenth of the sales price of the mica; the amount depending on the size of the deposit and the distance transported.

The accompanying map shows the location of the most important mica mines in Georgia, most of which are not now in operation and some of which have not operated for years. Mines and undeveloped prospects are numerous in certain counties, such as Upson, Monroe, Pickens, Cherokee, Jackson, Hall, Lumpkin, Union, and Rabun. Certain other counties, often with similar bedrock, have either no pegmatites or ores containing little or no commercial mica.

Mica mining is by no means a thing of the past, although but few mines would pay at the low prices prevailing at this time. The electrical industry is consuming increasing quantities of sheet mica and new uses are constantly being found for ground scrap mica. A general rise in prices would result in the opening of new and old mica mines in Georgia. The chances of success will be greatest in the areas containing a number of mines close to railroad transportation so that a grinding mill can

be built at the railroad to utilize the waste and scrap mica.

(Continued from Page 5)

past two weeks. The work here consists chiefly of firebreak construction in Tel-chair and Dodge counties.

East Bulloch Acreage Increased

Both acreage and membership in the East Bulloch T. P. O. has increased since the camp was established there. The organization at the beginning of this year contained only 12,000 acres, but now we have 68,000 acres signed in one solid body.

We have applied for one wooden tower for this T. P. O. and if approved, it will adequately cover the protected area, as it is in a compact body.

DISTRICT SEVEN **C. B. Beale, District Forester** **Waycross**

Notes on Emergency Conservation Work—District 7

The nine C. C. C. camps in this district are getting down to business now on the million and a half acres of land scheduled to be covered by work in thirteen counties. Grubbing out a strip of land 25 feet wide across hill land, cypress and pine flats, hardwood hammocks, and creek swamps means plenty of work if you ask a C. C. C. man about it. No one ever realizes what a tremendously greater portion of these old burned over pine stumps lies underneath the ground until one witnesses pile after pile of these stumps along mile after mile of fire break. Some one hundred miles of breaks have been grubbed and cleared so far.

A new method of logging has been introduced in this section. No longer are trees felled with an axe or saw by cutting off near the base according to orthodox practice. Instead, a crew sets to work digging around a veteran pine until one thinks they have about dug themselves through to China, and then deep in the earth (maybe 6 feet deep) two men get down in the hole with a cross-cut saw and saw off tap roots and the tree falls, stump, tap root and all. My, wouldn't Paul Bunyon get a kick out of this!

One fellow over at Camp 52, Homerville, thinks a T. P. O. is a totem pole.

A foreman down in Camden, Camp No. 60, asked for a tough assignment and he got it all right. About a 10 foot growth of gallberry and palmetto all the way from Colesburg to Forest View. Wouldn't be surprised if he doesn't run on to a dinosaur in that jungle.

Superintendent Rogers' Camp No. 70, at Nahunta, looks like a South Sea island village by the way his office and the army headquarters are covered with palmetto thatch.

The Baxley Camp, No. 62, has named itself "Camp Alabax", a combination of Alabama and Baxley, since the boys hail from 'Bama and Baxley.

Superintendent Sanders, Camp No. 65, Jesup, evidently is a strong believer in "Early-to-bed and early-to-rise". His veterans start to work at 5 A. M. and are back at 2 P. M.

Superintendent Meyers, Camp No. 59, Fargo, is making Suwanoochee Creek look ragged by the number of fire breaks he is cutting across it.

These Okefenokee boys, Camp No. 72, Waycross, under Superintendent Martin, are headed right straight for the swamp, itself on some of their breaks, but guess they'll slow down some when they strike Wheeler's Fortune on the edge of the Okefenokee! Hamp Mizell says they'll run into a "jamb" there.

The boys down at St. George, Camp No. 71, are constructing a break straight down Trail ridge, but some of them are still wondering where the "ridge" is.

Some of the boys at Homerville, Camp No. 52, may not be able to tell you how far it is to Thelma, but they can estimate the distance by the number of swamps they cut through.

Camp No. 68, Douglas, has a grandstand and ball park right at their door. Wonder what those camps in the mountains are doing for a ball ground?

The 58th annual meeting of the American Forestry Association will be held at Franconia, New Hampshire, on September 5, 6, 7, and 8. Seven other forestry organizations within that same region will join in the rally. Secretary of Agriculture Wallace and Robert Fechner, director of the conservation work, are both on the program.

Leading Tree Planters

The greatest individual plantings of tree seedlings are those of a New Yorker and a Georgian. Beginning in 1915, Thomas F. Luther, Mechanicsville, Saratoga county, New York, has planted 5,473,600 trees.

In Georgia, James Fowler, Soperton, in Treutlen county, beginning in 1926, has planted 1,500,000 slash pines.

State Forester's Meeting Place

The annual meeting of the Association of State Foresters will be held this year in Indiana, with R. F. Wilcox, State Forester, as host.

The meeting date has not been set, but it is usually held in October. A three-day itinerary of forest areas of Indiana is planned.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
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ol. 3

ATLANTA, GA., OCTOBER, 1933

No. 10

ROBERT E. PRICE DROWNS IN SURF

Member of Georgia Commission of Forestry and Geological Development Meets Untimely Death — Cause of Forestry Suffers

Robert E. Price, member of the Commission of Forestry and Geological Development, and manager of the Sea Island Company, with headquarters at Kingsland, was drowned while bathing at the Fernandina, Florida beach, Sunday, September 17. Burial was at Arlington National Cemetery September 20. In his death, one of the leaders of forestry in Georgia has been lost. He was one of the newer members of the State Commission of Forestry and Geological Development, and during the short period of service showed keen interest in promoting the work of the commission.

Mr. Price was 46 years of age, having been born August 3, 1887 at Swinton, England. Early in life he moved to the United States and for a number of years lived at Washington, D. C., and was in government service. At the outbreak of the World War he was in charge of the lighting system of the Mississippi river. During the war he was captain in the engineering corps, making an excellent record.

Coming to Georgia, he devoted his time and talents to forestry and forest products, becoming manager of the Bertha Mineral Company, with large interests in southeast Georgia, and later became manager of the Sea Island Company properties. Among his activities has been the direction of large naval stores and sawmill operations.

Mr. Price was deservedly popular, with a large acquaintance among leading people of southeast Georgia. He was always active in promoting the interests of his section, and will be greatly missed. He was a member of the Brunswick Rotary club, a Mason and a member of Alee Temple, Shriners.

While bathing at the Fernandina beach, Mr. Price and two others were caught by a large wave and carried into a swift slough. He aided his companions to get out of the swift waters, encouraging them in their efforts, only to find himself exhausted and unable to escape. All were rescued except Mr. Price whose body about an hour later

was washed up on the beach approximately 1,800 feet from the point where he was last seen. A prolonged effort was made to resuscitate him, but to no avail.

Among those in bathing with Mr. Price was his sister, Mrs. Robert McPherson, Washington, D. C., who had a narrow escape from drowning.

TURPENTINED TREES GOOD FOR NEWSPRINT

Dr. Herty's Tests at State Pulp and Paper Laboratory Show Turpentinizing Does not Affect Fibre for Paper Making.

Speaking before the naval stores section of the Savannah Chamber of Commerce September 8, Dr. Chas. H. Herty, in charge of the State Pulp and Paper Laboratory operated by the Department of Forestry and Geological Development, said that turpented trees can be used in the manufacture of white newsprint paper. Cuttings from tree trunks above the turpentine scars, he said, have been used in experiments with great success.

"These logs were readily and completely converted into sulphite pulp and groundwood," he said, "and from these pulps excellent sheets of white standard newsprint were produced."

Analyses of the wood pulp above the scar surface of the tree has proven that the amount of resinous material extracted is identical in each case, he stated. "It is a most perfect demonstration that the pine tree is a producer and not a storehouse of crude turpentine."

Dr. Herty estimated the available wood at "three quarters of a million cords", or enough to provide sufficient raw material "for 25 per cent of the total newsprint consumed annually in the United States." He said, however, that he would gladly accept the higher estimate of the naval stores men who placed the increase in available supply made possible by this discovery at 25,000,000 cords.

For the year ending April 1, 1932, Georgia produced 51 per cent of the total naval stores of this country. Florida was next with 34. These two states, therefore, account for 85 per cent of the whole.

MILLIONS DISTRIBUTED TO OPERATE CAMPS

About Half of Purchases made in Vicinity of Camps—About \$15,000,000 Spent Monthly — Over Quarter Million Spent Monthly in Georgia

Georgia is benefitting from a monthly expenditure of a quarter to one-half of a million dollars for operating thirty-six C. C. camps within its borders. According to Director Robert Fechner, about half of the purchases for camp supplies are made in the vicinity of the camps.

The cost to the federal government for maintaining the civilian conservation corps work is approximately \$15,000,000 a month to employ, feed, clothe and transport 310,000 forest workers and provide tools and other equipment.

The following list of supplies will give an idea of the magnitude of the undertaking: 1,000,000 pairs of cotton socks; 1,000,000 pairs of woolen socks; 500,000 pairs of shoes; 784,000 suits of underwear; 1,000,000 pairs of denim jumpers; 200,000 raincoats; 625,000 shirts; 1,000,000 summer undershirts; 48,000 pairs of rubber boots; 12,000 tents; 185,000 denim hats; 250,000 canvas cots; 2,500,000 yards of denim; 88,000 overalls; 1,000,000 towels.

In the list of equipment is enumerated 100,000 axes, 152,000 shovels, 152,000 wedges, 114,000 mattocks, 114,000 picks, 60,000 saws, 100,000 hammers, 40,000 crowbars, 30,000 chisels, 15,000 brush hooks, 15,000 peavies, 70,000 canteens, 12,000 grindstones, 2,500 blasting machines, 60,000 files, 633,000 feet of rope, 7,500 wrenches, 6,000 wrecking bars, 2,000 wheelbarrows, 7,000 forks, 200 tons of dynamite, 250,000 pounds of cement, 100,000 feet of blasting fuse, 3,000 gallons of paint.

Many other supplies such as lumber, telephone poles and wire should be added, but figures are not available.

When it comes to food supplies, it is estimated that every thirty days as many as 9,000,000 eggs, 1,125,000 pounds of bacon, 5,625,000 pounds of beef, 1,125,000 pounds of coffee, 6,750,000 pounds of flour and 2,500,000 pounds of pork are consumed. No figures are available as to vegetables.

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Bruce Suttle. Plant Engineer
W. F. Allen. Chemist
James Dempsey. Asst. Chemist

Extension Foresters

Bonnell Stone, Chairman, Oxford
Dupre Barrett, Athens
K. S. Trowbridge, Tifton

SMALL WOOD-WORKING INDUSTRIES IMPORTANT

Secretary of Agriculture Henry A. Wallace, speaking before the annual meeting of the American Forestry Association, September 6, emphasized the importance of small wood-working industries and cited New England where such enterprises in the same families for generation, have produced lumber, boxes, furniture, toys, woodenware, maple sugar and novelties of many kinds.

Mr. Wallace said: "They employ a large amount of labor per unit of product. They utilize the timber more closely than sawmills, thereby yielding larger returns to the timber owner. The operation enables farmers to employ themselves and their teams getting out the timber, or to secure work for wages at the plants. The values in the finished products are mostly in labor. The money received for them is, therefore, mostly net cash income to the community, which has a stimulating effect on its buying power.

"Protection of forests from fire is vital to this great nation and the world." — Franklin D. Roosevelt.

SOME TREE DISEASES

By DuPre Barrett, Extension Forester

Many diseases and parasites attack trees and eventually kill or destroy their beauty. Many of these diseases are allowed to enter the tree by the careless action of man.

Wood decay is caused by fungi. The mycelium of the fungi penetrates through or between the wood cells, producing enzymes which soften the cells or disintegrate the middle layer between the cells, thus destroying stability of the aggregate as by the crumbling of the plaster or the brick of a wall. Within the tree this disintegration may occur either in the heartwood or in the sapwood, or in both.

The life of a tree may be much reduced by decay of the heartwood, the tree's main mechanical support. Decay of the sapwood further hastens death by interfering with the flow of the sap.

The tree's natural protection against fungus invasion is the bark, consisting of cells with specially resistant walls, cutinized or supplied with resin, gum, or other repellents. Moreover, dead bark is not generally nutritious and does not offer attractive food to the fungus. The bark protection is normally ample, but in case of removal of this natural protection and exposure of either sapwood or heartwood, especially the latter, the path is open and it is through wounds offering such exposure that rot in standing timber usually begins. Such rots might therefore be called "wound decays".

The fungi which cause these decays in the main are the larger fungi of the toadstool type. After the decay is well under way the spore-bearing toadstools appear upon the surface of the diseased parts. A branch broken or sawed off, broken or split by wind, or the trunk or bole of the tree bumped by the wheel of a wagon or hacked or scarred by fire, give an opportunity for fungus spores to enter. After they once enter the tree the fungus spreads up and down the tree. In some cases, one species of fungus may grow on many different kinds of wood. Other fungi are more particular as to their food supply and are found on fewer hosts.

Fungi chiefly fall into two groups, those having spores on gills and those with spores borne in pores. Still others bear their spores upon spines. To determine the particular species of fungus present, it is usually necessary to examine the sporophore, and even then expert or special study is necessary. The determination of the species of the fungus is, however, not necessary to proper treatment, since this is much the same for all.

Care should be exercised in felling trees to avoid injuring other trees. In general, infected trees should be cut for fuel. With valuable lawn or shade trees the infected part should be removed and the cavity treated with an antiseptic such as paint or

coal tar. It is not necessary to fill cavities with concrete or asphalt, but good drainage for the wound is very necessary.

Space will not allow me to go into detailed discussion of the many diseases attacking forest trees, but a few of the more prevalent ones that attack the trees of the south will be discussed briefly.

White heart-rot (*Fomes igniarius*): This is the most important of the heart-rots of the south and is found on beech, aspen, birch, poplar, willow, maple, hornbeam, white elm, butternut, black walnut, hickory and the oaks. The amount of damage is beyond estimation. In many cases the entire stand of large timber becomes valueless.

Heart-rot is chiefly a disease of the heartwood, but in time will encroach upon the sapwood, and death may result by weakening the tree to the breaking point. The disease enters through broken limbs or old stumps where coppice is resorted to in reproduction. The first sure sign of the disease externally is the presence of sporophores, although sounding of the trunk with an axe is sometimes resorted to.

The sporophores, numbering sometimes as many as ten on a tree are shelving, roof-shaped bodies from three to four inches wide. The upper side is brown, later becoming black, hard and smooth. The spores are in layers put on annually and the lower surface is gray to reddish brown. Control is by burning the infected parts. Avoid wounding the trees and in case of very valuable trees excision may be practiced.

Canker, gall, twig-blight — These diseases occur on nearly all kinds of trees. Galls are swollen parts and often appear on the main trunk near the ground line as in the case of the peach tree, but also on limbs some distance above the ground.

Cankers are bark diseases, but cause the death of the cambium beneath the bark. This disease is common on apple, walnut and many other species.

Twig-blight is common on many forest trees and horticultural species. Pear blight is an example.

In treatment of the above diseases, heavy pruning and burning of the diseased parts may be best for control, but spraying with a fungicide has proven beneficial. Of course one cannot treat forests as a whole, but trees around the home, where it would take years to replace them, may be treated.

Then we find diseases attacking the roots of our forest trees. One which is very damaging to elm, basswood, oak, cottonwood, persimmon, maple, china tree, mulberry, apple and pear is known as **Azonium Root-rot**.

The chief symptoms of the disease is wilting of the tree, but where only a part of the root system is infected, the tree may have only an unhealthy appearance. The roots which have died are incased with a cinnamon-buff felt hyphae, in which strands are conspicuous.

(Continued on Page 8)

QUESTION BOX

Is the gum produced by chipped pines the sap of the trees?

No, the resin is not sap but is produced by special cells or resin ducts extending up and down the trees which, when cut, begin to produce abundant gum or resin. The ducts are connected laterally so as to form one system and a wound stimulates activity in producing gum, perhaps, several inches from the cut. The gum hardens gradually sealing the exposed ends of the duct and virtually stops "bleeding". To renew the flow, an additional wound is made by making a new "streak" above the old one.

What is the best protection against "black gnats" so common in forests of the mountains at night?

The "black gnat" of the mountains is one of about 30 species, some of which are in the mountains and others around salt marshes of the Atlantic and Gulf coasts. They are also known as sand flies, midges, sand gnats and punkies.

The entomologists of the United States Department of Agriculture recommend creosoting or draining knot holes in wooded areas. These holes are favorite breeding places in the forests. Ditching and spraying ditch banks and marsh edges with creosoted pine sap—a by-product of creosoting plants—gives effective control along salt marshes.

Lights attract the insects. Applications of pine oil or oil of sassafras to the hands and face provide protection. These oils mixed with fly sprays to which a heavy mineral oil has been added at the rate of 1 to 3 parts of the spray, may be applied to window and door screens with good effect.

Why is the black locust recommended for eroded lands?

The black locust is a comparatively rapid growing tree even on poor soils such as exist on washed land. An important reason for black locust doing well on poor land is that it belongs to the legume family of plants. Legumes are capable of cooperating with a certain root nodule bacteria to get some of its nitrogen from the air, which non-legumes are unable to do. Eroded soils contain very little nitrogen.

The black locust is well rooted and therefore a good soil holder. Its wood is quite durable in contact with the soil, thus making it good for fence posts. No tree is better naturally to producing fence posts than the black locust.

Is the magnolia, growing in the forests of south Georgia the same magnolia that is planted on lawns for ornamental purposes?

Yes, it is the same species, magnolia

grandiflora, native to southern United States. It attains large size and is valued for its beautiful wood, usually being converted into veneer and used for furniture, fixtures and interior finishings.

Other species of the magnolia, the large leaf cucumber tree, (*magnolia macrophylla*); mountain magnolia, (*magnolia fraseri*); cucumber tree, (*magnolia acuminata*); umbrella tree (*magnolia tripetala*); are native to the mountains.

Cucumber tree (*magnolia pyramidata*); cucumber tree (*magnolia cordata*) and bay (*magnolia virginiana*) and magnolia grandiflora are native to the coastal plains.

What do foresters mean by "mineral soil"?

It is a rather inadequate term used for describing soils largely derived from minerals, such as lower soils which do not contain much organic material or humus.

Strictly speaking, no soil made up solely of minerals is a complete soil. The very important plant food element, nitrogen, gets into the ground through the medium of vegetation, and soils lacking in organic matter, such as clay sub-soils, contain so little nitrogen that they cannot effectively feed plants.

A soil is not fertile unless it contains all the necessary elements of plant food. Abundant mineral elements could not be used by a tree if nitrogen were absent.

Since nitrogen is contributed to the soil through the medium of organic matter, such as the fallen leaves of the tree, the burning of these leaves by fire is very destructive of the ability of the soil to feed the trees.

IMPORTED LOGS BROUGHT DREAD ELM DISEASE

The Dutch elm disease, now playing havoc with American shade trees in New York and New Jersey promises to invade forests and wipe out the elms of the country as blight did the chestnut.

According to federal authorities, this disease has been introduced into this country in elm burl logs imported from Europe for the cutting of fancy veneer.

By controlling this source of infection, and by a thorough check-up of elms in all areas that may have been exposed, the authorities hope to stamp out every trace of the disease and then to keep it out. Civilian Conservation Corps are assisting in felling and burning elms found to be infected.

Southern Pine Leads

Up to 1931 southern pines led in lumber production. Douglas fir led for that year, but in 1932 southern pines resumed leadership, the output being 3,068,898,000 feet, while Douglas fir was 2,912,425,000 feet.

Louisiana led again in hardwood lumber production in 1932. West Virginia was second.

EXTENSION FORESTERS WORK WITH CAMPS

Vocational Forestry School, 4-H Club, Boy Scout, and CCC Camps Offer Opportunities for Educational Work—Moving Pictures Used.

During the summer a considerable part of the time of the extension foresters had been given to presenting forestry to the vocational forestry school camp, various 4-H club camps, boy scouts and CCC camps. The work at the camps consists of aiding in the educational programs by presenting the subject of forestry in talks, forest excursions and moving pictures.

The extension foresters were called into service at the vocational forest school camp for three weeks this summer to take the places of district foresters who ordinarily constitute the staff of instructors, but who were prevented from attending by duties of the CCC camps. Bonnell Stone and DuPre Barrett, extension foresters, rendered valuable service as instructors.

Both before the vocational forestry school camp and after, DuPre Barrett has visited a number of 4-H club camps, conducted tree identification excursions and then gave forestry moving pictures. He closed work of this nature with a large group assembled at Camp Wilkerson at Athens. Mr. Barrett has also displayed moving pictures at CCC camps in his district, which embraces the mountain and upper piedmont area of North Georgia.

Mr. Bonnell Stone, besides participating in the vocational forestry school camp, has visited CCC camps to help in the educational program, and has devoted considerable time in studying local forestry data of his district, to put on a campaign to help the small land owners in the fall and winter.

J. K. Trowbridge, extension forester in South Georgia with headquarters at Tifton, has rendered valuable service to distillers of turpentine, especially in introducing improved methods developed by the Bureau of Chemistry and Soils. He has also found time to contact timber owners and various camps to give instruction in forestry.

Peep Hole Forestry Exhibit at Chicago

A novel feature of the United States Forestry exhibit suited to economize the limited space allotted is a peep hole in the bark of a Douglas fir tree. Through this hole the spectator sees a miniature forest revolving inside the tree and an exhibition of various phases of forest management and utilization in the shifting scene.

Generally speaking, reforestation naturally follows fire prevention. Let nature do her work.

TURPENTINE PRODUCERS PLAN CURTAILMENTS

At a meeting of 409 gum turpentine and rosin producers representing 60 per cent of naval stores output of last year, held at Valdosta, Ga., September 14, it was decided by a 75 per cent vote to adopt an agreement to reduce production, allowable under the federal agricultural adjustment act.

A committee to be appointed by the chairman was authorized to submit a tentative agreement to Secretary of Agriculture Wallace for such changes as were considered advisable, and then ask for a hearing in Jacksonville, Florida, before it becomes operative.

No price fixing was contemplated.

Opposition was voiced by the naval stores factors, but they expressed willingness to stand by producers should the plan be adopted.

TREE INTRODUCTIONS NUMEROUS SPECIES

The date palm was introduced in 1904. From the Molucca Islands came the aillanthus tree. First it was raised in China. Englishmen introduced it from China and we in turn got it from England.

From Europe we introduced white and Lombardy poplars, white willow, Norway spruce, European larch, Scotch pine, Maritime pine, Austrian pine, Corsican pine, and many other species.

China provided us with the Chinese elm, bamboo, tung oil tree, Chinese pistacho, and Chinese chestnuts (incidentally the chestnut blight). Eastern Asia supplied the Cedar of Lebanon.

From India comes the deodar cedar, and from Japan the ginkgo, Japanese Cryptomeria, mulberry, maples, and 90 named varieties of chestnut and bamboo.

From Australia we got the eucalyptus or blue gum, and from Siam the Chaulmoogra tree. The oil produced from the fruit of this tree is used for treatment of leprosy. From Northwest Africa comes the Atlas Mt. cedar.

These are only a few of the many trees, forest and ornamental, introduced into the United States from foreign lands.

Russell M. Ziegler,
In Service Letter (Pa.)

GEORGIAN APPALACHIAN TRAIL CLUB MEETING

On October 14-15, the Georgia Appalachian Trail Club will hold its annual meeting at Cloudland. The Atlanta Bird Club and the Atlanta Nature Club have been invited and have accepted the invitation to join in the meeting.

The officers of the Georgia Appalachian Trail Club are as follows:

President, Warner Hall, Decatur; vice president, J. M. Tinker, Athens; secretary, Olivia Herren, Atlanta; Treasurer, C. Roderrick Taaffee, Atlanta; Executive Council, Mrs. Mary W. Snow, Atlanta; Lewis H.

Johnson, Decatur; Everett B. Stone, Jr., Gainesville.

Plans are being made to schedule a number of week-end hikes during the fall and winter, some of them along sections of the Appalachian trail between where it enters Georgia from North Carolina and its southern terminus at Mt. Oglethorpe.

COLLECTING PINE SEED

Between October 1 and 15 is usually the best time to collect pine seed for planting. The cones may not have been completely browned, but still have a tinge of green. If, upon examination, the seed are full formed, firm and not milky, one can be sure that the seed are not too green to pick.

If one can find a sawmill crew cutting pines during October, the cones can be gathered quickly and easily from the fallen tops.

Those who collect pine seed for sale should be sure about the species of pine and should be very careful not to mix the seed of different species.

After the burs have been gathered, they may be spread in a dry, airy place until thoroughly dry. Then the seed may be beaten from the burs, the wings of the seed removed and the seed placed in tight containers.

PAPER FROM TURPENTINED TREES USED FOR PRINT

The September 16 issue of the Naval Stores Review, published at Savannah, contained a supplement in which paper made from Georgia pines that had been chipped for gum, was used.

The paper was produced at the State Pulp and Paper Laboratory of the Department of Forestry and Geological Development. The paper is of excellent newsprint quality.

WBAL, Baltimore Broadcasting Station, has followed the lead of Germany and erected a wooden tower, the first of its kind in the United States. This, with other improvements, it is claimed, has improved transmission 200 per cent.

Charles A. Gillett is the first state forester of Arkansas. He is a graduate of Cornell University where he also obtained a degree of Master of Forestry. Previous to going to Arkansas, he was extension forester of North Dakota.

The forestry division of the Louisiana Department of Conservation has established an educational section to carry on publicity and work with schools of the state to promote interest in forestry development.

The United States is credited with having 850 species of trees of which 180 are considered to have economic value.

FIRST DISTRICT

W. D. Young, District Forester
Rome

Camp 58, Gilmer County

CCC workers are busy now building winter quarters. Work in the field has been going on full blast. Truck trail construction is under way; telephone crews are busy constructing approved lines and also construction of fire towers on top of Rich Mountain, 4081 feet elevation, is under way. Seven CCC boys have already made application to Supt. Simmons to man the tower as soon as completed.

Camp 77, Pickens County

Work on lands of the Pickens County TPO, building truck trails for forest fire prevention, is progressing nicely. Several miles of truck trails and foot trails have been completed. Work on construction of telephone lines and one fire tower will be started soon, now that approval of location has been received. All the CCC workers are enthusiastic upon learning that P-77 would continue through this winter, and the camp commander is busy flooring tents and getting ready for winter weather.

Camp 80, Lookout Mountain

Camp P-80 is manned by world war veterans, who moved into camp on or about the 18th of July. This camp is located on the historic Lookout Mountain. All seem to enjoy camp life again and are working with fine spirit. A sub-camp has been established at the upper end of the protected area on Lookout Mountain and manned by



Truck trail constructed by C.C.C. workers
in Mountains of North Georgia

sixty men from the main camp. This arrangement saves time in transportation and increases the number of daily hours on the job. As soon as work outlined is completed on the Lookout Mountain part of the protected area, the sub-camp will be moved to Pigeon ridge. The Lookout Mountain TPO at the beginning of the camp only contained 12,500 acres. To date 30,000 acres have been signed up and new members and acreage are being added as fast as possible. It is planned to make this TPO a 60,000 acre unit before the work plan of the camp is completed.

DISTRICT TWO

**Everett B. Stone, Jr., Dist.
Forester
Gainesville**

**Vogel Park's Fall Coloring—
Improvements Made**

With the coming of fall the mountains of north Georgia are perhaps at their best with the wonderful riot of color with which the foliage is transformed. At no other time of the year do the mountains seem so inviting, the clear cool weather which is characteristic of this season of the year making it much easier to exert oneself without discomfort.

As a result of the activities of the Civilian Conservation Corps, under the direction of the Georgia Forest Service, the Vogel park has been made more accessible by additional trails so that all parts of this area are now opened up. The program of development of this area is now well under way and several structures to add to the interest and comfort of visitors, have been completed. The parking area at Neel Gap has been enlarged to accommodate a larger number of people and is much better than ever before.

The trail to the summit of Blood mountain, some two miles to the west of Neel Gap, has been much improved and parts of it relocated. Blood mountain, with an elevation of 4463 feet is one of the largest mountains in Georgia and is the most easily accessible of any of the higher mountains in the state.

Trails from two directions have been built to the DeSoto falls on the south side of the Blue Ridge, and this spot is rapidly becoming a favorite objective for hikers. The trail to Level Land mountain, one mile to the east of Neel Gap, has been improved and new trails have been constructed into other areas at the gap.

Many people have been visiting the area during the last few weeks and it is hoped that still more will take advantage of an opportunity to visit this area during the fall months. Vogel Park is situated 45 miles northeast of Gainesville on the summit of the Blue Ridge and may be reached over State Route No. 11.

**Indian Springs State Park
Improvements**

Work being undertaken by the State Forest Service with the Civilian Conservation Corp camp at Indian Springs is well under way. New and attractive trails have been constructed to all parts of the area. The parking area has been enlarged and improved.

Several bridges are under construction and the natural advantages of the area are gradually being developed and brought to the attention of the visitor.

The museum building, which is to house a collection of Indian relics, will be completed in a short time. This building as well as most of the other structures which

are being undertaken on state parks are being constructed of native stone and other material to be found locally.

All improvement work is being done with a minimum cash outlay through the use of materials secured locally without cost.

A gravity water supply system is being developed for the area and a large planting plan is to be undertaken this fall in an effort to bring the park back to its former native state when it was covered with a wonderful forest with a wealth of smaller flowering shrubs.

The park has been a Mecca for picnic parties and others who wish to enjoy an outdoor outing and it will be more attractive than ever with the fall season's coloring of foliage.

Indian Springs State Park is situated on State Route No. 42—four miles south of Jackson and 17 miles north of Forsyth, and is only about 2 hours ride by automobile from Atlanta.

FOURTH DISTRICT

**W. G. Wallace, Dist. Forester
Columbus**

Pine Mountain Work

The annual scourging of Pine Mountain by forest fires only a few years ago, was an occurrence that seemed inevitable to the local people. The burning was not looked upon as doing any great damage except by a few, and no organized steps were taken to control such fires. In fact it was more the custom for each landowner to "backfire" from his own yard and fields in order to keep from getting burned out, the result being that Pine Mountain in all its sixty-five miles of unique scenic beauty was often afire from one end to the other.

When Franklin D. Roosevelt, a conservationist at heart, came to Warm Springs first to try to regain his health he was agreeably impressed with the nature and friendship of the native Georgians, but I am sure he was dismayed at the indifference and lack of cooperation shown in the conservation of our great natural resource—the forests.

Through his leadership, and the influence of his great personality and friendship he caused to be formed an organization pledged to the protection of several thousand acres of timberland on Pine Mountain. Such has been the influence of this organization both directly and indirectly, that native Georgians living within the "eyes" of Pine Mountain are often heard to remark on the comparative absence of fire on the mountain.

But this small Timber Protective Organization actually protected only a small part of the range of mountains known as Pine Mountain.

Again, however, our great leader steps

into the picture—this time as President of our great nation. The Emergency Conservation Work, a product of President Roosevelt's own mind, has established at Warm Springs one of its work camps. This camp, through the leadership of the Georgia Forest Service, has assumed the responsibility of taking the present Timber Protective Organization and from it building a much enlarged organization equipped and organized for efficient fire protection.

Among the work projects of this camp, now well under way, is the construction of twenty-five miles of firebreak along the ridge of the mountain which will be built into a scenic highway and maintained as such by the counties through which it passes. This road will be a spur of the projected Savannah-Seattle Highway. The triple "C" boys are working mighty hard to finish their work on this firebreak so that President Roosevelt may ride over it when he comes down in November.



**C.C. Camp boys clearing fire break—
Cut Trees at Roots.**

C. C. C. Activities

The camp at Warm Springs, made up of boys from Savannah, have named their camp "Camp Meriwether" at the suggestion of the Womans Club of Warm Springs which has been very interested in beautifying the camp as well as making the boys' sojourn more interesting. It is reported that they plan soon to bake an individual cake for each person in camp, including Army and Forestry personnel. A book shower is also planned.

Superintendent Flowers reports steady progress by his hard working boys.

The Butler Camp boys, made up of boys from Mississippi, have named their camp "Camp Magnolia" after the state flower of Mississippi. Camp Magnolia boys thought they would never get out from under medical quarantine, but when they did the Taylor County people gave them a big dinner at the Court House square. These Mississippi boys are now home and they don't mind it either.

Superintendent Barrett is well pleased with the progress being made by his camp.

Camp Meriwether boys have made quite a reputation for themselves through their baseball team. They have the habit of being on the long end of the score most of the time.

We are also proud of the fact that Camp Meriwether was rated the best camp in this district of Georgia and Florida by the Army and placed third in the camps of the 4th corps area.

DISTRICT SIX

Jack Thurmond, District Forester
Savannah

Ready to Re-enlist

Many of the enlisted men at Camp 53, Hinesville, Georgia have expressed their desire to re-enlist for another six months period. It seems that the high water in this section, which has flooded all the swamps and low country, has as yet to dampen their spirits. Many miles of firebreak and right of way have been cleaned, regardless of weather conditions.

Thinning Work on State Property

The improvement cuttings on State Property at Teachers' College, Statesboro, Georgia has greatly improved the looks of their woodlot and has added to the value of the remaining timber. Some seven weeks with a crew of thirty men were required to accomplish the work, which was handled from Camp P-66, Brooklet, Georgia.

Fire Tower Planned

A meeting was held Monday night, September 18th, at Brooklet, Georgia, with some seventy members of the T. P. O. present and plans were discussed relative to the purchase of a tower by the East Bulloch T. P. O. New officers were elected. Mr. John Knight was elected President, succeeding T. R. Bryan and E. W. Graham succeeded T. D. Proctor as Secretary-Treasurer.

Telephone Line Construction

Landowners in Liberty and Long T. P. O.'s have given some five hundred Cypress telephone poles to be used in constructing the telephone lines supporting their tower organization. These poles were donated and line construction will follow in the near future.

The boys at Camp P-61, Soperton, Georgia, enjoy building fire breaks through areas covered by planted vines, as there are no stumps to be extracted.

Supervisory personnel and enlisted men regretted to see Captain G. C. McKinley, Camp Commander, leave Camp P-53, Hinesville, Georgia, as he was very popular with every one connected with the camp. He is now back at Fort Benning, Columbus, Ga.

DISTRICT SEVEN

C. B. Beale, District Forester
Waycross

New T. P. O. Interest

New T. P. O.'s are being organized in this district, and the old ones have increased greatly. Moreover, the members are pledging their support to the cause of fire protection.

Sometime ago, at a meeting of landowners at Pearson, in Atkinson county, one man expressed his belief that "running a little fire through the woods at night didn't hurt", and several grey haired veterans of the turpentine industry jumped up and simultaneously declared, "You're wrong there".

Kiwanians Cooperate

Over in Baxley, in Appling county, the local Kiwanis club cooperating with Camp Superintendent H. C. Brown, of P-62, have at various times raised money to employ a man to traverse the county for the cause of fire protection and the E. C. work.

3-C Men Good Fire Fighters

Fire fighting crews have been organized at each camp, and at the first call a group of brown-skinned, determined C. C. C. boys led by the superintendent and supervisory personnel, pile on a truck and rush to the rescue of the pines with water pumps and flaps. Late one night an alarm aroused camp "Alabax", at Baxley, and the gang rushed to a burning turpentine still just out of Baxley to save the owner two or three thousand dollars by putting the fire out before it had done much damage. The owner of the still is now enthusiastic about the C. C. C.



Completed South Georgia fire break made by Albany C.C.C. camp.

Camp 68, Douglas, is busy filling in additional T. P. O. land on their map. Clark, the chief foreman, states that he has said "T. P. O." so often he talks about it in his sleep.

Camp 71, St. George; Camp 72, Waycross, and Camp 59, Fargo, are protecting three sides of the great Okefenokee, the land of "trembling earth". If a fire gets in, it can't get out, and vice versa.

Every camp in this district now has its full complement of trucks and it is amazing how far back along the turpentine woods trails these trucks can navigate.

The boys at Camp 72 are getting to be experts on unloading freight cars. To date the unloading crew has emptied twenty-five freight cars of 63 one and one-half ton trucks, 19 ten disc plows; 1000 miles telephone line, 60,000 brackets and 60,000 insulators. Now let them send on the tower steel.

Camp Superintendent C. L. Burnett, P-68, Douglas, resigned, effective October 1, to accept a position in Atlanta. Mr. Burnett made many friends while in this section, and his loyalty and hard work in developing the Coffee-Jeff Davis project is greatly appreciated by the citizens of those counties. Mr. Burnett leaves a well-organized project to his successor.

Heavy rains during the first part of September made some of the project areas almost inaccessible. There's always plenty of "hill land" breaks to be worked on, however, when the water gets over waist deep.

Supt. Rogers has established a side camp of 40 men down on Buffalo Creek in south Brantley. Foreman J. J. Bennett is in charge and reports they are turning out a lot of work from this camp.

The Commanding Officer at P-60, Colesburg, says his men are the happiest bunch of boys he has ever seen.

The foresters at Camp 65, Jesup, have purchased rubber boots. The high water doesn't hold them back.

Edward C. M. Richards, West Chester, Pennsylvania, has been chosen forester of the Tennessee Valley project, with headquarters at Knoxville, Tenn. Mr. Richards is a graduate of Yale Forestry School and has spent some time studying forestry in Europe.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

FELDSPAR IN GEORGIA

by

RICHARD W. SMITH

Assistant State Geologist

Feldspar is not the name of a specific mineral, but is the term given in mineralogy to an important group or intergrading series of similar rock-forming minerals. These are all silicates of aluminum containing either potash, soda, or lime, or two of these bases together. The potash feldspars are the most desired for commercial use although the soda feldspars are mined to some extent. The lime feldspars are seldom used.

The physical properties of all varieties of feldspar are remarkably similar, making them hard to tell apart without a chemical analysis. They all have much the same hardness and specific gravity. The potash feldspars range in color from white to grayish yellow, or any shade of red from light rose to brick. The soda-lime feldspars are generally white, although they may be reddish, greenish, bluish, or gray. Feldspars generally have two distinct cleavages along which they break with surfaces showing a high lustre as though polished. These cleavages intersect at approximately right angles with the potash feldspars, and at 86 degrees with the soda-lime feldspars, but this difference in angle is too slight to be detected without careful measurement. The soda-lime feldspars may often be distinguished from the potash feldspars by the presence of faint straight striations or minute rulings on the cleavage faces, visible only by turning the crystal slightly one way or another at the proper angle to the light. The feldspars may be distinguished from quartz, with which they are most often associated, by their distinctive cleavage; by their translucent, rather than glassy appearance; and by their hardness, the feldspar being softer than quartz.

The feldspars are the most abundant group of minerals, being one of the main constituents of granite and related igneous rocks. The feldspars in these rocks, however, range in size from that of a pin-head to one-half inch or so across, and are so intimately associated with other minerals that their separation is difficult. The feldspar of commerce is obtained from pegmatite dikes. Pegmatites are largely composed of the same minerals that are found in granite—quartz, feldspar, and mica—but usually in very large, rather than small, crystals. These pegmatite dikes are vein-like masses which are very irregular as to length, width, and the size and

distribution of their various minerals. Feldspar often makes up from 50 to 80 per cent of the rock mass, but is commonly intergrown with quartz and other minerals, so that usually less than 10 or 20 per cent of the pegmatite body is commercial feldspar.

The principal use of feldspar is as a flux in the manufacture of glass, pottery, enamel ware, brick, and tile. Its use in glass is principally in the manufacture of bottles, pressed ware, and opalescent and opaque glass. Feldspar constitutes from 10 to 35 per cent of the body and from 30 to 50 per cent of the glaze of most white-ware pottery. It is also an important constituent of electrical and other forms of porcelain. The enamels used on cast iron bath tubs, wash bowls, and similar articles contain considerable quantities of feldspar. The feldspar for these uses, which account for about 87 per cent of the domestic consumption, must be free from iron-bearing minerals such as biotite, garnet, hornblende, and black tourmaline, which would affect the color of the fired product. The maximum limit of free quartz ranges from 5 to 20 per cent, depending on the use. Exceptionally pure potash feldspar is used in the manufacture of artificial teeth and high-grade table china.

Feldspar is also used in minor amounts as a constituent of scouring soaps and window-cleaning compounds, as a binder in the manufacture of emery and corundum wheels; in the manufacture of certain floor coverings; and as a constituent of roofing material, sand paper, paint, wood filler, and terra cotta.

Crushed feldspar is used in the form of granules for surfacing prepared roofing, in concrete work, in stucco and pebble dash, in the facing of cement blocks designed to resemble granite, and in terrazzo work. It is also sold for foundry facings, for use as a sand-blast material, and as a poultry grit.

The feldspar industry of the United States has undergone a profound change in the last 10 years. Feldspar was formerly produced by many small independent companies, each producing one or two types of spar, often varying considerably in grade from time to time. The consumer could seldom give specifications of the feldspar he wanted, and could only try samples until he found one that suited and then hope that the producer could continue to supply feldspar like the sample.

Today the situation has changed. Nearly every consumer can give precise chemical,

mineral, and grinding specifications. In order to meet these specifications, the producers have combined into several large companies, each owning a number of different feldspar mines. By means of frequent chemical analyses of the product from each one of these mines and separate storage of each lot at the grinding mill, weighed amounts from each lot can be combined to produce any grade of feldspar desired. By thus being able to furnish ground feldspar in a wide range of grades and with the certainty of being able to duplicate the order at any time, these large companies have increased the use of feldspar and have eliminated most of the trouble between producer and consumer. It has, however, made it extremely difficult for the small independent miner to sell his product, particularly if distant from the main feldspar grinding districts. He can sell his crude feldspar to one of the large producing and grinding companies only if it is of exceptional purity and of a type not supplied by their own mines, or by selling it cheaper than they can mine a similar grade themselves.

The pegmatites of the Piedmont Plateau and Appalachian Mountain section of Georgia nearly all contain feldspar. Fresh feldspar is seldom seen on the outcrop because surface weathering, often extending to some depth, has altered it to a white clay called primary kaolin. The feldspar in most of the deposits is too mixed with quartz or in too small quantities to be of commercial value. A few outcrops, however, and certain of the larger mica mines, particularly in the mountain sections, expose deposits of feldspar that appear to be equal in quality and quantity to some now being mined in North Carolina. The only development in Georgia has been a few tons mined during the World War. This lack of development is due principally to their inaccessibility and isolation from other promising deposits. Some of the best deposits are still distant from railroad transportation, but roads to them are improving and truck haulage is now a possibility. An increase in mica mining in Georgia would probably expose more feldspar deposits. At least 30 years of mica mining preceded the development of North Carolina's important feldspar industry.

Georgia, while not now a producer of feldspar, could possibly supply some of the high-potash spar that the North Carolina and Tennessee grinding mills need to mix with their more common lower grade types. There is a possibility that future prospecting and mining may disclose sufficient deposits of the various types necessary to support a feldspar grinding industry within the State.

Europe consumes more of the naval stores produced in this country than the United States. In 1907 exports were 67 per cent of the output.

EIGHTH DISTRICT

**H. D. Story, Jr., Dist. Forester
Albany**

Tree Nursery Prospects

The state tree nursery at Albany is growing seedlings of high quality, with well developed root systems. The seedlings will be ready to take from the nursery plots and set in plantations where they are to grow, about October 1. According to the way orders are coming in for these seedlings, the demand may be greater than the supply.

Log Cabin at Nursery

A log cabin to house the nursery manager is being constructed on the nursery site. Men from the C. C. C. camp are used for this purpose. An attractive and suitable building will be the result of their labor.



State Tree Nursery at Albany has large supply of excellent pine planting stock

P-54 C. C. C. Camp

The Dougherty county camp is well along with its firebreak construction work. All crews are operating full strength and full time. Twenty-five foot breaks, cleaned of forest growth and plowed are presenting barriers that will discourage any fire.

Production of naval stores in the United States in 1932 was the smallest since 1906 except for one year. Even so, there is an over supply waiting a revival of industrial activity to consume and provide a demand that will justify increased production.

Forests were never intended by the Creator to be burned. Fire hurts trees.

If you scorch a hardwood tree, you introduce decay.

Let trees grow in the gullies and save the land.

Burn off the forest floor if you want to kill seedlings, and rob your children of their trees.

**GEOLOGICAL SURVEY OF
WARM SPRINGS AREA****Long Time Effort for Complete Geological Study of Interesting Area Succeeds—Dr. G. W. Crickmay, Assistant State Geologist, Assigned to Work Beginning October 1**

For several years, George Foster Peabody, native Georgian and former owner of Warm Springs property, but now a resident of Saratoga, New York, has sought a detailed geological survey of the Warm Springs area similar to the survey made of Hot Springs, Ark. His efforts have succeeded.

State Geologist S. W. McCallie has been communicating with W. C. Mendenhall, Director of the United States Geological Survey urging the survey and outlining

plans of procedure. Agreement was reached that the work would be financed with public work funds made available by the federal government, and that Assistant State Geologist Geoffrey W. Crickmay, of Georgia, would be assigned to begin the work October 1.

Dr. Crickmay will receive supervisory assistance from one or two geologists in Washington. The appointment of Dr. Crickmay is accompanied by a high tribute from the Director of the Geological Survey, who considers him as one fitted by training, experience, ability and familiarity with the area to successfully carry on the investigation of this unusual geological area. He is to be temporarily relieved of duties with the Georgia Geological Survey to do this work.

A study is to be made of the geological structure, the warm springs of the region, the occurrence of various minerals, and will include a complete mapping of the area.

The resolution pledged the support of the state geologists to assist the U. S. Geological Survey in carrying into effect the program of topographic surveying; in bringing to the attention of the U. S. Geological Survey the names of unemploy-

ed engineers and geologists that may be employed; to advise as to areas to be surveyed to meet public needs, and urge that areas of public domain not be given disproportionate preference.

This committee report was signed by the following State Geologists: S. W. McCallie, Georgia; G. E. Condrum, Nebraska; Howard E. Simpson, North Dakota; Arthur Bevan, Virginia; M. M. Leighton, Illinois, president of the association.

**TOPOGRAPHIC MAPPING
WORK FOR GEORGIA****U. S. Geological Survey to Renew Topographic Surveying from Federal Allotment—State Geologists to Cooperate**

Georgia is to get a share of the federal allotment of \$2,400,000 made for topographic surveys. The amount to be spent for such work in Georgia has not yet been announced; nor the time for beginning the work.

In view of an announcement of this undertaking, a special meeting of the Association of American State Geologists was called for Chicago, August 29. State Geologist S. W. McCallie, of Georgia, attended and participated in the meeting, heading a committee that drafted resolutions addressed to Harold L. Ickes, Secretary of the Department of Interior, expressing the views of the geologists.

The Hooker Oak of California is the largest leafing tree in America; 3,000 people could be shaded when it is in leaf.

Forest lands of the United States in a productive condition will give constant employment to two million men.

The oldest and largest living things that have escaped man's destruction are trees.

Soil fertility has been created by the residue of plants. Burn your forests, starve your trees.

TREE DISEASES

(Continued from Page 2)

There is little that can be recommended for the infected tree, but if a tree is known to have died of the disease, the ground should be disinfected before another tree of the same species is planted; but it is better still to change the planting to a species not attacked by root-rot.

Many tree diseases are beyond the ordinary layman to identify; therefore, he should send specimens to state or federal plant pathologist for identification and for advice as to method of control.

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DEPARTMENT OF FORESTRY AND
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No. 11

S. W. McCALLIE, STATE GEOLOGIST, DIES

**End Came Quickly October 26 at
His Home, Closing the Career of
One of the Nation's Leading Geol-
ogists—Served Georgia for Forty
Years**

Samual Washington McCallie, age 77, died suddenly at his home in Atlanta at 9 p. m., October 26 with a heart attack. He had worked at his office in the state capitol during the day and was in good spirits. Shortly after the evening meal he had a heart attack and within an hour passed away with words about the State Geological Survey on his lips.

The announcement of his death came as a shock to a great many friends and admirers in Georgia and in the scientific world, where he was recognized as one of the leading geologists of the nation.

When notified of his death, Governor Eugene Talmadge, ex-officio chairman of the Commission of Forestry and Geological Development under which Mr. McCallie held office, paid him the following tribute: "The state has lost the services of an efficient geologist and the devotion of one of the most earnest workers I ever knew. He was a high type man, able and conscientious."

Professor McCallie came to Georgia from the University of Tennessee where he had taught Geology and Biology, becoming assistant state geologist of Georgia in 1893. In this capacity he served until 1908, when he was made state geologist and served faithfully and well in that office until his death. His many years of earnest, painstaking and thorough work, many of them spent in the field, resulted in a large number of authoritative reports on the mineral resources of Georgia.

In the later years of his life he directed the work of his assistants in the field, but daily received visitors, many of them citizens of Georgia bringing samples of minerals to be identified and to have their value appraised. His personal service in the office won for him the confidence and admiration of people in all walks of life.

The connection of Mr. McCallie with the State Geological Survey has been co-exten-

sive with the great mineral developments in the state. His reports on many of the mineral resources have provided the basic information that attracted the attention of capital and encouraged investments. To this extent he has been one of the great builders of Georgia. His attitude was always that of the scientist, concerned only



S. W. McCALLIE, STATE GEOLOGIST

Died Suddenly October 26

with exact facts. His chief enjoyment was in finding out and making known the truth.

Mr. McCallie was always interested in developing the state's various material resources, and he was among those who encouraged the formation and development of the State Department of Agriculture, the State Highway Department and the State Forest Service. Early activities along these lines were carried on by the State Geological Survey, and of particular value were exhibits made at various expositions, some of which are preserved in the state museum of the state capitol.

(Continued on Page 3, Column 1)

INDIAN SPRINGS PARK HISTORIC LOCATION

**New Buildings, Roads, Trails and
Beautification Added by C. C. C.
Workers—Park to be Great At-
traction**

The oldest state park in Georgia was donated by the Creek Indians. One hundred acres at Indian Springs was ceded to Georgia on condition that it never pass into private ownership, because Chief McIntosh wanted to reserve for public use the spring's water which he considered had medicinal value.

The one-hundred-acre spring reservation was, however, reduced by private possession to about twelve acres. But in recent years citizens of Butts county purchased and returned to the state enough land to about double the twelve-acre tract.

The sulphur water, so highly valued by the Indians, has for a long time been the chief attraction of Indian Springs. It accounted for the construction of hotels and the annual visit of thousands of persons from all parts of the country in quest of health.

In recent years the property has been made a state park, and is now being developed along broader lines with the three-fold purpose of providing mineral water in a sanitary manner, in worthily emphasizing the historic interest of the site and in providing park facilities of the most attractive kind.

Improvement of Spring

The protection of the spring by the present management was the first undertaking. The spring was subject to freshet overflow of a nearby creek, and thus rendered unsanitary. Protection was provided by levees and pumping facilities. Further protection of the water from contamination has been provided by a beautiful stone structure, or spring house, made of neighboring stone and covered with tile roof. The spring is under glass cover; its water issues through a pipe and is thus made available without the least possibility of outside contamination.

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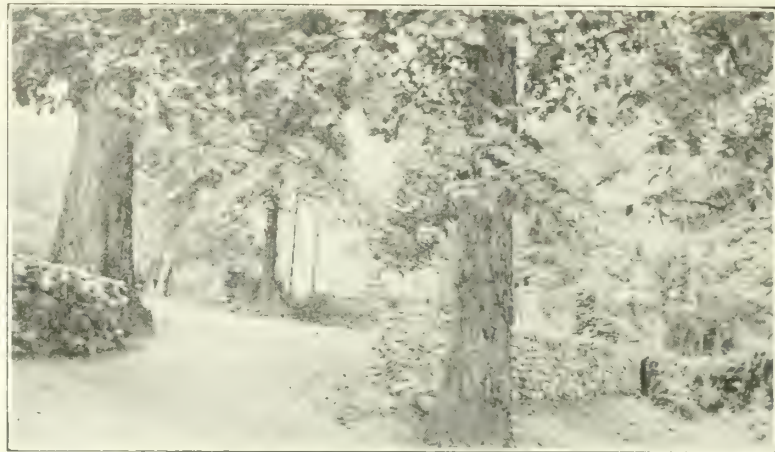
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Commemorative Developments

In emphasizing and perpetuating the historic interest of Indian Springs, the Commission of Forestry and Geological Development, having charge of the park, authorized the construction of a museum building in which Indian artifacts and Indian history relating to Georgia, are to be featured. The walls of this building, also constructed of neighboring stone, is nearing completion.

It is the plan to eventually rebuild in stone, the wooden structures now in use, near the spring, so that the public will have for its accommodations a series of buildings of harmonious design and arrangement.

The most important historic events associated with Indian Springs revolve about General William McIntosh, Creek Indian Chief, who in 1800 built a cottage near what is now designated "McIntosh Rock." In 1823 General McIntosh and Joel Bailey erected the first hotel at Indian Springs in response to a growing demand for accommodations from those visiting this health resort. This building remained in good state of preservation until 1920, when it was burned.



Indian Springs Park, Showing Some Recent Improvements

The event of greatest historical interest at Indian Springs was February 12, 1825, when the Creek Indians, under the leadership of Chief McIntosh, ceded to the State of Georgia the remaining land between the Flint and Ocmulgee rivers, as far north as the Chattahoochee, excepting 100 acres at Indian Springs, 640 acres on the Ocmulgee river that had been improved by McIntosh and a tract of land around the U. S. Government Indian agency at Macon as long as such agency was continued.

McIntosh was a half breed, a first cousin of Governor Troup of Georgia. While devoted to the Creeks, he was a friend of Georgia. The Indian Springs treaty of 1825 was bitterly resisted by the Upper Creeks, whose headquarters were in North Alabama, and by some of the Lower Creeks. It was on the McIntosh rock that the fiery orator, Hop-o-eth-le-yo-ho-lo, of the Upper Creeks, made his famous tirade, closing with a reference to McIntosh: "Before many moons your own blood shall wash out the memory of this hated treaty. Brothers, I have spoken."

The noble Chief McIntosh was slain at his home in what is now Carroll county, a martyr to his friendship for Georgia.

Eighty-six years after the signing of the treaty of 1825, members of the Piedmont Continental Chapter of the Daughters of the American Revolution unveiled a bronze

tablet on the McIntosh stone in front of the present Varner House, which reads as follows:

"Here on February 12, 1825, William McIntosh, a chief of the Creek Nation, signed the treaty which ceded to the State of Georgia all the Creek lands west of the Flint river. For this act he was savagely murdered by a band of Indians who opposed the treaty. Placed by the Piedmont Continental Chapter of the Daughters of the American Revolution A. D. 1911."

On the occasion of the unveiling the visitors were welcomed by Judge Ogden Persons of Forsyth, and the principal address was delivered by Judge Joseph Henry Lumpkin of the Supreme Court of Georgia.

Beautifying and Equipping the Park

At the present time a C. C. C. camp is located at Indian Springs which provides labor with which to carry out a program of grading, road, trail and retaining wall construction, stream bed improvement and landscaping work.

The development of plans for the Indian Springs Park is largely in the hands of Mrs. M. E. Judd, Dalton, and Mr. J. M. Mallory of Savannah, constituting a park committee of the Commission of Forestry and Geological Development. Mrs. Judd, as a landscape gardener by profession, has



Road and Retaining Wall in Indian Springs Park

given much time and attention to a beautification program, including roads, trails, bridges and plantings of various kinds.

The help received from Emergency Relief work funds of the Federal government has enabled the Commission of Forestry and Geological Development to materialize plans which otherwise would have involved years to accomplish.

Before another summer season has opened Indian Springs will present a new appearance; it will become a show place of the state, bringing to visitors pleasure, instruction, recreation, health and a realization of what a state park can mean for the happiness of people.

S. W. McCALLIE, STATE GEOLOGIST DIES

(Continued from Page 1)

Mr. McCallie wrote 63 scientific books and papers dealing with the mineral resources of Georgia. Among these are: "Marbles of Georgia," 1894 (second edition 1907); "Phosphates and Marls of Georgia," 1896; "Artesian Wells of Georgia," 1898; "Roads and Road-Building Materials of Georgia," 1901; "Iron Ores of Polk, Bartow and Floyd Counties of Georgia," 1900; "Coal Deposits of Georgia," 1904; "Fossil Iron Ore Deposits of Georgia," 1908; "Mineral Springs of Georgia," 1913; "Brown Iron Ores of Georgia," 1913; "Mineral Resources of Georgia," 1910, (revised in 1926); "Public Roads of Georgia," 1910, (revised 1912); "Drainage Investigations of Georgia," 1911.

Among the scientific societies to which Professor McCallie belonged were: American Society for the Advancement of Science; National Association of State Geologists; American Geographical Society; American Institute of Mining Engineers.

Only a short while before his death he attended a call meeting of the National Association of State Geologists in Chicago in which he took a prominent part, being chairman of the committee drafting resolutions expressing the attitude of the state geologists on topographic surveys with Federal work funds.

Mr. McCallie was born August 6, 1856, of Scotch ancestry in Sevier county, near Knoxville, Tennessee. He was educated in the public schools, graduated from what is now the University of Chattanooga, and attended Johns Hopkins University, where he specialized in geology. He was a public school teacher until he became a member of the faculty of the University of Tennessee, later to become assistant state geologist of Georgia.

He is survived by his wife and two daughters, Edith and Elizabeth; by one brother, Dr. J. M. McCallie, a supervisor in the educational system of the State of

New Jersey, and by several nephews and nieces. He was a member of the Presbyterian church.

The funeral services were conducted October 28 and burial occurred at Atlanta.

MORE PUBLIC PARKS NEED OF GEORGIA

Most people like to go into the woods. Naturally the human race should have an instinctive liking for trees, for trees have proven friends and helpers of man from the beginning of time.

Trees are impressive. They are the largest of living things. They are silent, serene and comforting to one who is nerve tired. Their shade is inviting, their fall coloring a joy to behold, the wild life they harbor a source of interest and enjoyment.

But a great many people have no forests of their own. Naturally they do not want to trespass. Their only chance to enjoy the woods is in public parks.

The state of Georgia has provided very few places for the public to satisfy a natural craving for the outdoors; only three state parks, in fact, one at Indian Springs in Butts county, one at Neel Gap on the Blue Ridge mountains in Union county, known as Vogel Park, and one at Crawfordville, the Alexander Stephens Memorial Park.

Just three. Are there no other suitable sites for state parks? Most assuredly. Georgia is rich in historic interest. Markers have been erected at many points where history has been made. Other spots notable as places where issues of nation and state have been decided, are known only by their crumbling remains, so much neglected as to be scarcely known.

State parks have proven profitable investments in many states, when measured only by money returns. Some states have gone to great lengths to attract and give the public pleasure. Cottages, camping sites, boating, fishing, museums, playground equipment, picnic facilities, all to attract people seeking outdoor enjoyment, providing it at such attractively low prices as to make the cost no hindrance. And yet the small fees have paid the expense of maintaining the parks, and more.

Georgia has many natural attractions, mountains, lakes, seacoast, and forests well suited to park sites, and, as has been mentioned, it has many historic points of interest that should be commemorated with suitable parks.

Prospective tourists write to ask where Georgia's state parks are located and what facilities are offered. They are "park conscious" and would love the parks if they were designed to accommodate transients. It is always in an apologetic vein that visitors are written that Georgia has only three parks.

HOW FALL FOLIAGE GETS ITS COLORS

When cold weather comes suddenly and the sunlight is bright, foliage takes on brilliant autumn hues. But if cold weather comes gradually and the weather is dry, the leaves lack brilliance and turn brown.

The weather conditions of the mountains of Georgia are usually more favorable for leaf coloring than the lowlands of south or middle Georgia. Naturally, the mountain sides provide a better display than the level lands. It is, therefore, to be expected that Georgians should turn to the mountains in the fall to witness a colorful display of foliage.

Although many colors are displayed in leaves, only three important color groups are involved, the anthocyanins or "flower blues," carotinoids that give various shades of yellow, and chlorophyll that provides the shades of green. Of these only the first two are factors in coloring autumn leaves.

A typical anthocyan is violet in color and turns blue where alkalies are present in the leaf cells and red in the presence of acids. The predominance of alkalies or acids in the soils determines in a measure the hues of blues or reds, not only in fall leaves, but in flowers. Trees also vary in their ability to take alkalies or acids from soils into their sap.

Anthocyanins, a form of sugar, do not accumulate to an appreciable extent until fall approaches when sap becomes sluggish, allowing the anthocyanins to accumulate locally.

Bright sunlight in the autumn is essential to brilliance in leaf coloring, for the anthocyanins will not form in abundance without plenty of light.

Carotinoids, essentially yellow, are present in the leaves in summer, but are dominated beyond visibility by green chlorophyll. It is only when the chlorophyll disappears at the end of the growing season that the yellow of carotinoids appears.

Autumn colors of foliage in the main are due to the presence of carotinoids or mixtures of carotinoids and anthocyanins. If a cold snap comes suddenly while the leaves are full of sap, anthocyanins will be formed in great abundance, and then will the sweetgums, hickories, yellow poplars, sycamores, sour wood, maples, etc., put on their finest array of colors. The fact that when cold weather approaches slowly leaves do not color brightly is explained by the comparatively light production of anthocyanins in the leaves.

The question may be asked as to whether these bright autumnal colors serve the tree in any useful manner.

A theory is that it is a provision of nature for rapid absorption of heat in order to hasten life processes for ripening fruits and preparing for winter de-

foliation. The retirement of green chlorophyll leaves carotinoids and anthocyanins to absorb the heat directly, and hasten the maturing process preceding dormancy of fall and winter.

ARCHAEOLOGICAL SOCIETY OF GEORGIA ORGANIZED

On Friday, October 13, a number of people interested in promoting archaeological research and the preservation of the remains of ancient races in this state, met in Macon and formed the Georgia Archaeological Society.

The meeting was presided over by General Walter Harris, of Macon, one of the most prominent students of archaeology in the state.

An interesting and encouraging address was made by Dr. Walter Jones, state geologist of Alabama and an outstanding archaeologist of the south.

The following officers were elected:

Dr. C. C. Harrold, Macon, President; J. M. Mallory, Savannah, first vice-president; Mrs. M. E. Judd, Dalton, second vice-president; L. M. Soloman, Macon, secretary; Bonnell Stone, Oxford, treasurer; General Walter Harris, Macon; Dr. A. V. Henry, Atlanta; Judge Ogden Persons, Forsyth; R. W. Smith, Atlanta, executive committee.

STUART, U. S. FORESTER FALLS TO DEATH

Robert Y. Stuart, Chief Forester of the United States, accidentally fell from the seventh floor window of the forestry building at Washington on October 23 and died enroute to a hospital. Further details of the accident are not known as this publication goes to press.

Major Stuart had been chief forester since 1929, coming to the position from the office of state forester of Pennsylvania. In his death the cause of forestry has lost one of its great leaders. He had been under great strain in handling the vast volume of work incident to operating the C. C. C. camps.

Pulpwood Cutters'

Shortsighted Methods

In cutting pulpwood for a paper mill at Panama City, Florida, the land owners are following the short-sighted policy which the sawmills followed in the past. According to State Forester Harry Lee Baker, the timberlands are cut clean, no seed trees being left to start a new crop of pines. He warns West Florida, where this practice is followed that the future pulpwood supply is threatened, and advises leaving three to five good sized trees per acre.

NEWSPRINT FROM PINES MEETS GOVERNMENT TESTS

United States Bureau of Standards Says Southern Pine Paper Made at Georgia Pulp and Paper Laboratory Meets Requirements for Newspaper Use

The results of tests made by the United States Bureau of Standards of paper made from southern pines by the Georgia Pulp and Paper Laboratory, at Savannah, have been reported in the United States News, published at Washington, D. C., as follows:

"Newsprint paper manufacture may become an important industry for the south.

"Such paper manufactured from abandoned turpentine trees recently has been tested at the bureau of standards by Burton W. Schribner, chief of the paper division of the bureau. Mr. Schribner says that the paper meets all requirements for newspaper use, having a good printing format and the necessary whiteness.

"The samples which were tested were furnished by Dr. Charles H. Herty, a former president of the American Chemical Society, and now chief of the division of pulp and paper of the Georgia state department of forestry.

"While Mr. Schribner has not been furnished data with regard to the cost of production, he has been assured a process has been evolved by Dr. Herty which has distinct economic importance for this country and which may result in eliminating a large portion of the imports of newsprint pulp from Canada.

"The lumber division of the Commerce Department has received reports at various times of the experiments which have been conducted to find some use for the enormous acreage of pines from which turpentine has been drawn. Reports indicate that 750,000,000 cords of such timber become available each year, an amount sufficient to provide a large proportion of the newsprint consumed annually in the United States.

"Dr. Herty, in submitting the samples of the paper to the bureau of standards, explained that a mill in Georgia is now producing the paper. Printed newspapers were included in the samples.

"Newsprint standards do not require an especially high grade of paper, according to Mr. Schribner. He points out that durability is not an important factor but that the paper must be of sufficient quality to take a clear impression of type.

"Spruce has been commonly used as a source of newsprint. Since much of the spruce used in the manufacture of newsprint now comes from Canada, transportation has been a large factor in newsprint costs.

"Reports made to the bureau from Geor-

gia indicate that many southern business men expect that the new process will eliminate much of the use of Canadian newsprint in the south."

C. C. C. Boys in N. R. A.

Parade in Atlanta

A feature of the great NRA parade in Atlanta in early October, and one that attracted attention and applause all along the line, was the two Civilian Conservation Corps, one from Warm Springs and one from Indian Springs.

Among the personnel of the two companies were a number of Atlanta men. The fine appearance, glowing health and vigor of these outdoor workers of the forest was the subject of comment.

WOOLFORD ACTIVE ON GEORGIA-FLORIDA CANAL

The success of an undertaking to construct the Georgia-Florida intercoastal navigation canal across North Florida and South Georgia, will depend largely on the activity of T. G. Woolford, Atlanta, president of the Georgia Forestry Association, who is chairman of the canal commission.

Mr. Woolford has given much time, thought and means to promote this undertaking. He has been aggressive and thorough in bringing facts and arguments to the attention of the government and has not stopped short of conferring with President Roosevelt.

The undertaking from Mr. Woolford's standpoint has been purely unselfish and actuated by high motives of service to the end that great good may come to the south and to the nation by the construction of this important waterway.

Yellow Poplar Valuable For Producing Honey

From a recent bulletin on yellow poplar prepared by E. F. McCarly as Technical Bulletin No. 356 of the U. S. Department of Agriculture, this paragraph is taken:

"In addition to its more obvious qualities, yellow poplar has distinctive value as a honey tree. According to J. I. Hamblen, of the Bureau of Entomology, a yellow poplar less than 20 years of age will yield during the season approximately eight pounds of nectar, equal to four pounds of honey. At ten cents a pound for honey, a tree of this size may produce upward of forty cents a year revenue for the bee keeper, an income that compares favorably with the returns to be gained from other yellow poplar products."

"Chestnut for Distinctive Paneling" is the title of an interesting pamphlet issued by the Appalachian Hardwood Manufacturers, Inc., Cincinnati. It is designed for distribution among architects and builders.

QUESTION BOX

What species of trees would you recommend for highway planting in North Georgia?

A number of species of trees native to the section are well suited for roadside planting. Various oaks, elms, pines, red bud, sycamores, red gum, hickories, dogwoods, may be mentioned. Among the pines, the loblolly is the most rapid growing.

The trees mentioned can be transplanted from the forest. It is best to transplant small rather than large stock and to prune back the limbs rather than cut them back to the trunk, leaving no limbs.

What is the best time to deaden trees by girdling?

Trees can be girdled at any time effectively. The cut should be made deeply so as to not only sever the cambium layer under the bark, but to penetrate the underlying sapwood.

How would you compare the cost of wood and coal as fuel?

Generally it takes one and a half to two cords of wood to equal the heat value of one ton of coal. The prices of wood and coal vary locally. Harvesting wood on one's own land with labor that otherwise would be idle, makes wood decidedly cheaper than coal unless one should be located near a coal mine.

When is the best time to transplant young pines of the woods to the fields in North Georgia?

It is better to transplant in March before trees begin new growth. Use seedlings only one to two years old. Remove the seedlings so as to preserve as many roots as possible. Place them in a bucket of water and keep them moist till planted. Make planting holes deep enough to accommodate the tap root without cramping or twisting it into an unnatural position. Press the earth firmly around the roots.

In planting walnut seed, is it better to crack them first?

The seed should be planted without cracking, the danger being that cracking will let molds enter the seed. Nature will take care of germination in a more satisfactory manner if the nut is planted without cracking.

Are pine seed in cones of trees felled in October good if not gathered until November?

If weather has been comparatively dry, the seed in the burs will not have molded and should still be good. You can try a simple germination test to determine their viability.

FIRST DISTRICT W. D. Young, District Forester Rome

Camp P-80

The Lookout Mountain TPO is located partly in three counties, namely, Chattooga, Walker and Dade. When all land is signed up, it will be a very compact unit, lying on the top of Lookout Mountain and Pigeon Ridge. The county commissioners of each county in the protected area are very enthusiastic over the work of the camp and are giving excellent co-operation in their loan of additional road machinery, such as tractors, road machines, air drill compressor and air drill.

Pot Licker

One of the veterans at P-80 states that before he got a job with the C. C. C.'s he had gotten down to eating corn bread and turnip greens. When he reached the conditioning camp at Fort McPherson, all the men had blood tests made and his registered 98 per cent pot-licker.

Martha Berry TPO

The Martha Berry TPO has increased its land under protection from 25,000 to 30,000 acres. Additional fire-fighting equipment will be purchased soon. Since the patrolman has been given a horse, he can move about more quickly, and less trouble with fires is reported.

P-77, Tate, Ga.

An additional six months has been granted P-77 to complete the work plan as outlined, and by the time snow flies assurance is given that the TPO signed acreage will be increased to about 40,000.

DISTRICT THREE C. N. Elliott, District Forester Augusta

Gwinn-Nixon State Forest

Several projects are being carried on in the 100 acres of land known as the Gwinn-Nixon State Forest, in Richmond county. This work is conducted by Camp P-57 in Burke county. Drainage ditches have been dug through the "pipe clay" prevalent in the forest. Fire breaks have been constructed as follows: 30 foot breaks surrounding the area, 10 foot breaks through the forest, cutting it up into 10-acre blocks. These breaks will be sown to wheat and oats so that they will be green through the worst of the fire season, and will furnish food for the many birds found in the area. Approximately 17 acres have been planted to slash pine. Ten more acres will be put in longleaf pine, 10 acres in black walnut, several acres, as an experiment, in cypress. Some of the plots will be left as they now stand, while others will be thinned of undesirable trees. A tool house will be erected on the property and a well dug.

Signs are to be erected showing the nature of each plot.

Alexander Stephens Memorial Park

Camp P-64, which is located on the property of the Alexander Stephens Memorial Park, is at present confining all its activities to the park project. Roads and trails are being constructed throughout the park, bridges made over the ditches and streams, and the grounds landscaped with reference to high, uneven banks, trees, shrubs and grasses. The old Stephens home itself is being renovated. Plans are to restore it to exactly as it was when Stephens resided there. Several other buildings on the property will be remodeled.

Camp P-74, Toccoa, Ga.

The Toccoa camp is confining its activities to fire trails and truck trails on the Stephens County TPO. Old roads have been cleared and cleaned. New roads have been constructed back into country that is heavily timbered, where an annual loss from fire occurs. Plans for dividing this area up into square mile blocks are being carried out in every detail. The work, under Superintendent Thompson, is being carried out in every detail. Much interest is being shown by landowners living outside the TPO area. Many of the roads and trails of the TPO will connect other roads and trails being constructed in Habersham county by the Cornelia camp. A splendid fire system is being worked out by the two camps.

Camp P-57 to be Moved

Plans are being made to move Camp 57, located at Hatcher's Mill in Burke county, to Screven county, where the work will be confined to the lower Brier Creek TPO, below Sylvania. Side camps for the completion of the work already begun on the Nixon Forest will be established.

New Forest Area

The people of Augusta and Richmond county are interested in securing for the State of Georgia a new State Forest to embrace something like 10,000 acres of typical forest land lying on the dividing line of the Piedmont Plateau and the Coastal Plain of the state. Plans are that the new project will be self liquidating in a number of years. Officials of both Augusta and Richmond county are pushing the project. A loan is being sought through the Public Works Funds.

Selective Logging

"Selective Logging in the Shortleaf and Loblolly Pine Forests of the Gulf States" is the subject of technical bulletin No. 375 of the U. S. Department of Agriculture, recently issued. The information on which the bulletin is based was obtained in Louisiana, Arkansas and Texas. It is applicable to all parts of the South and gives methods of keeping pine forests up to maximum production standards and sustained yields.

FOURTH DISTRICT**W. G. Wallace, Dist. Forester
Columbus****Activities Camp 56, Warm Springs**

Camp 56 men and foremen are proud in announcing their first firebreak on Pine Mountain as finished. It has been hard work digging up large hardwood trees from rocky, mountain soil, but the incentive to finish this first firebreak has been furnished by the promised November visit to Warm Springs of President Roosevelt, who is acquainted with this firebreak. Specifications on this project called for a firebreak cleared and grubbed forty feet wide and thirteen miles long, reaching from the Warm Springs-Columbus highway to Tip Top, on the Atlanta-Columbus paved highway. All brush was burned, and the trees were saved and cut into suitable fuel wood, much of which is being hauled to camp for the winter fuel supply.

The Georgia Forest Service is pleased to announce that the county commissioners of Harris and Meriwether counties have agreed to build a high-grade road on the firebreak cleared and grubbed by the C. C. C. men. This will result in a firebreak much more efficient and cheaper to maintain. This road, now under construction, will be known as the Pine Mountain Scenic Highway which, as indicated by its name, will offer unique scenic beauty to persons attracted to this section of the state.

Side Camp at Newnan

A recent conference with city officials of Newnan, and Mr. H. H. North, Chairman, Newnan Water and Light Commission, resulted in the decision to establish a side camp on the one thousand acre Newnan Town Forest for the purpose of developing and protecting this forest as called for in a forest management plan prepared several years ago by the Georgia Forest Service.

Night Classes

Warm Springs school teachers, camp foremen, and the district forester are holding scheduled night classes in camp, teaching classes in regular grammar and high school subjects, dramatics, drafting, and forestry.

Pleased With Project

U. S. Forest Service officials from Washington and Asheville on a recent visit to the Warm Springs camp expressed themselves as favorably impressed with this project and the efficient way in which it is being handled.

Activities Camp 78, Butler

Superintendent Barrett has a tractor now, and with the rapid progress his Mississippi giants have been making in grubbing fire lanes he will soon be able to report many miles of plowed firebreaks.

It is understood that the county agent

of Taylor county and public spirited citizens interested in the welfare of their county are considering plans for promoting excellent quail hunting in their county through a systematic planting of suitable quail food on firebreaks each year as the firebreak is plowed for maintenance. This plan has many reciprocal advantages. A well organized and well stocked hunting preserve resulting from fire protection and the planting of quail food on firebreaks helps the landowner financially, through the lease of hunting rights, to maintain proper fire protection and thus help to grow profitable timber. Taylor county citizens expect it to attract many outsiders to its hunting fields in future years. A somewhat similar program has resulted in the well known quail hunting in certain sections of southwest Georgia.

The Georgia Forest Service lends its hearty approval to activities along this line.

SEVENTH DISTRICT**C. Bernard Beale, Dist. Forester
Waycross**

Sensing the approach of a critical fire period due to continued dry weather in this district, camp superintendents were wired to stand by with full forces over week ends, ready for any fire emergency. Down at Fargo, Camp P-59 didn't have to wait long. Sunday night after the telegram on Saturday, an alarm came in of a big fire several miles west of camp. The camp was prepared, and by immediate attack had the fire pronounced out early Monday morning, having used two crews and holding the fire loss to less than an estimated 600 acres. Take it from us, that would have been some fire had the gang not responded pronto, and anyone who has seen a wall of fire eat up a ten-year-rough in this country will agree with us.

In addition to fighting fire, the C. C. C. boys and a squad of national guards had flag raising exercises, speeches, etc.

Working in what we call "close order" organization, the boys in the woods around Camp P-71, St. George, are walking away with progress honors. Under the ever guiding hand of Superintendent Tittle they have already completed, including plowing, some 40 miles of firebreak and have most of the telephone poles cut.

Superintendent Rogers, Camp 70, Nahunta, was injured in an automobile accident October 19, while returning from the Hinesville camp on business. The work at Camp 70 is being carried on by Foreman J. R. James, acting superintendent, until Mr. Rogers gets back on the job.

Joe T. Clark, acting superintendent of

Camp P-68, Douglas, not only carries on the routine work around the camp, but gets out over Coffee and Jeff Davis counties and makes "booster" speeches at T. P. O. meetings.

Speaking of an interesting sight, one is certainly thrilled to see early morning activities at the C. C. C. camps. Truck warming up in the gray dawn, tools clanking, everybody busy—everybody happy. Each man in his own place. Mingled with the bustle of getting off to the woods is gay whistling and snatches of old plantation tunes. It's a great life in the C. C. C. camps, fellows.

In superb training from digging stumps out of the Okefenokee, the boys from P-72, Waycross, have some football team. They beat the Jacksonville Athletic Club, which had not been beaten in years, and the South Georgia College at Douglas. Tough guys, these Waycross fellows.

Some social event when they break loose with a dance, orchestra and everything, down at P-60, Colesburg. Superintendent Dyal says it makes the boys swing an axe better and more gracefully. Page Paul Bunyan.

Steel towers are being unloaded in this district. Forest fires may as well not start at all—they'll be spotted and killed before they can possibly get under way.

EIGHTH DISTRICT**H. D. Story, Jr., Dist. Forester
Albany****Albany Fire Week Emphasizes Forestry**

The city of Albany, which is famed for its great fire department and for fire control, recently observed "Fire Week" and included in its program strong emphasis of forest fire prevention.

A parade was given in Albany that attracted favorable comment. In the parade were 200 C. C. C. camp boys. These boys are located in the vicinity of Albany and have been constructing firebreaks, fire towers, etc., in that region.

The parade and articles on fire prevention appearing in the Albany Herald has done much to stir up interest in forest fire prevention in that section of the state.

Tree Seedlings Ready

The tree nursery at Albany now is ready to make shipments on orders for planting stock. Slash, longleaf, and loblolly pines are available at \$2.00 per thousand, express collect on delivery.

Those who intend to plant nursery seedlings should place their orders at once as the supply is likely to fall short of the demand.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

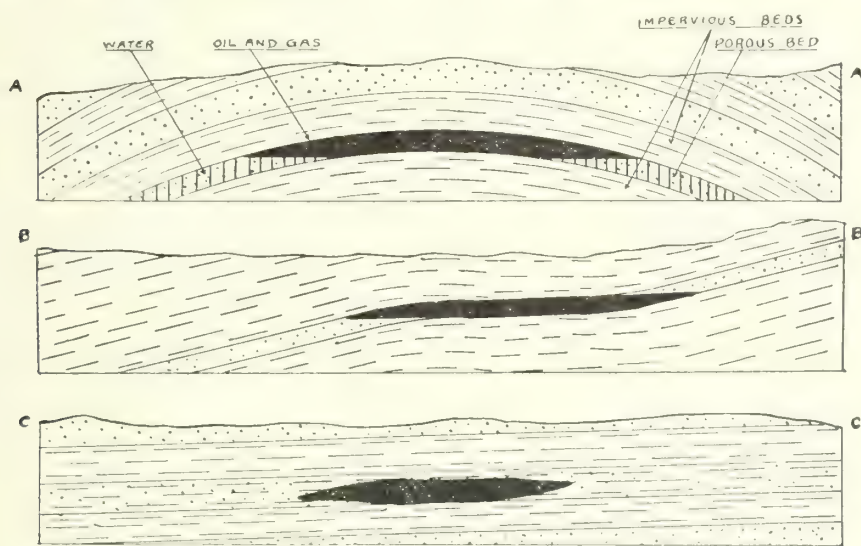
OIL POSSIBILITIES IN GEORGIA

Geoffrey W. Crickmay

Petroleum has been known since the earliest historic time in the form of natural seeps and springs, but it is only in recent years that the oil industry has grown to prominence. Just 74 years ago the first oil well was drilled in the United States but the oil was used not as a fuel but as a patent medicine. It was not long before other wells were drilled and other uses for this "earth oil" were sought. At this time illumination was entirely by oil

products of petroleum, ranks, in order of total money value, are: gasoline, kerosene, fuel oils and lubricants. There are, in addition, some three hundred or more miscellaneous products.

Petroleum is an oily hydrocarbon varying in color from pale straw through greens and reddish brown to nearly black. The crude oil consists of an intimate mixture of ether, gasoline, naphtha, kerosene, lubricating oils, and a "base." Each of these substances has its own boiling point, so that by heating each can be evaporated off in turn. The residue left after complete distillation, is known as the base of



Geological sections showing structures favorable for Oil Accumulation (after Prettyman and Cave). A-A Simple anticline with oil and gas (solid black) collected in porous bed at crest of field. B-B Terrace on monocline. C-C Porous lens on monocline.

is plant or animal remains. In unproven territory, then, the first pre-requisite in a search for oil is that the area contain fossil-bearing rocks. On the coastal plain of Georgia fossil shells, some of them rather similar to shells to be found along the sea coast today, occur on hills far above sea level. Some localities are particularly noteworthy for the number and diversity of shells that can be found. These shells are fossils that have been buried in sediments, mainly sands and muds, at a time when the Atlantic ocean extended far inland. Similar fossiliferous rocks of somewhat greater age occur in the northwest portion of the state. The mountain area and Piedmont Plateau are underlain by ancient crystalline rocks which contain no trace of fossils and hence in which there is little chance of finding oil. On the Piedmont Plateau and also in other parts of the state some ponds have a scum on the surface that at first sight looks like a coating of oil. However, when a sample of this material is collected and agitated, it separates out as a yellowish brown precipitate. It is actually iron hydroxide that has formed by the weathering of iron minerals in the rocks.

The hydrocarbons derived from fossil organisms, whether they be plant or animal, are converted into oil by a natural distillation probably initiated by bacteria. As the fossiliferous strata are covered over and buried by other sediments, they are naturally subjected to a certain amount of heat and pressure which completes the oil forming process. Part of the oil may be changed into natural gas, and in most oil fields varying amounts of gas are found with the oil. Time appears to be an important factor in the conversion of organic matter to oil and its subsequent migration into oil pools. The most recent sediments do not contain oil in a recoverable state, whereas in the most ancient rocks any oil that once existed has been completely dissipated. Furthermore, as a consequence of the continual change of heavy crude oil towards lighter derivatives, the older petroliferous rocks are, in general, the more prolific source of natural gas.

By slow migration within the fossiliferous sediments, the oil finds its way into porous layers known as reservoir rocks. The terms "oil reservoir" and "oil pool" do not imply that an actual pool in the ordinary sense of a surface lake exists underground. The oil occurs in small openings in such rocks as sandstone and limestone. The second pre-requisite for oil accumulation, then, is that a satisfactory reservoir rock exist, and that it be neither of too great nor of too young an age. Many of the strata in the Coastal Plain and some of those in northwest Georgia satisfy these requirements.

lamps, so naturally the newly found oil was used in them. It was found that after "boiling off" the more explosive oils, such as ether and gasoline, a satisfactory illuminating oil was obtained. Thus kerosene, or "coal oil," as it was first known, became the main product of petroleum.

With the rise of the automobile industry, which at the turn of the present century was in its infancy, gasoline took dominance over kerosene—the objectionable constituent which had caused so many fatal explosions of oil lamps and stoves now became the hub around which the whole petroleum industry revolved. By 1921 the United States alone was producing nearly half a billion barrels of oil a year. In 1929 domestic production reached its peak of a billion barrels of crude oil. At the present time the chief prod-

the oil and may be asphalt, paraffin, or both. The paraffin-base oils are, in general, the most valuable because of the quality of the lubricating stock they yield.

The accumulation of oil and natural gas is governed by certain geological principles that must be followed in any intelligent search for these materials in Georgia. The idea that oil can be located by the use of divining rods, "doodle bugs," and other such contrivances is entirely without scientific support. It is the purpose of this article to review briefly the main factors that underly the occurrence of oil, particularly as they apply to the possibilities of finding oil in Georgia.

Geologists are generally agreed that petroleum is derived from organic matter entombed in sediments but it is still uncertain whether the most important source

As oil and natural gas within the earth are under pressure, there is a tendency for them to escape by continual migration towards the earth's surface. For this reason a reservoir rock will not hold any oil unless it is overlain by a retaining strata, an impervious bed such as shale. Consequently, a definite stratigraphic succession is required for oil accumulation in commercial quantities, namely, a porous rock, such as sandstone or limestone, overlain, and in many cases underlain, by a relatively impervious strata such as shale. These conditions, which prevail in nearly all oil producing areas, are found in Georgia in the Coastal Plain and in the northwestern part of the state.

In most fields gas and oil are concentrated in restricted areas and elsewhere only water, usually saline, is found at the petroliferous horizon. The reason for this is that favorable structures cause the oil to migrate toward certain centres where it is trapped in pools. The job of the oil geologist is to map these structures and so determine the most advantageous place to start drilling. In Figure 1 are shown three types of structures favorable for oil accumulation: the anticline, monoclinical terrace, and lens. Where the strata are steeply folded and broken by faults the oil has an opportunity to escape. It is for this reason that the folded and faulted rocks of northwestern Georgia are considered unsatisfactory for commercial production. In south Georgia, on the other hand, the anticlinal and monoclinical structures are rare and where they do occur are very shallow. The lenticular type of structure pictured in section C-C is probably of common occurrence in the coastal plain sediments, but its presence beneath the surface can not be predicted by an examination of surface outcroppings.

Prettyman and Cave have summed up these four main pre-requisites for oil accumulation in the following words: "There must first be material from which oil may be derived, and this material needs then to be converted into liquid oil. After the formation of the liquid petroleum it is necessary that it be collected in commercial quantities, and it must be retained both during conversion and during succeeding time. All four of the above major conditions must be fulfilled and not one can be omitted." It may be added that if all four of these conditions prevail, even then there may not be oil in recoverable quantities.

Regarding the petroleum possibilities in Georgia, Prettyman and Cave, who made a complete survey some ten years ago, do not voice any optimism. The mountain and Piedmont Plateau areas are quite definitely condemned as barren. The northwestern part of the state, known as the Appalachian Valley and Ridge province and the Cumberland Plateau, is regarded as very un-

satisfactory for commercial production. The geological relations make it very difficult to determine whether there is or is not oil in the Coastal Plain of Georgia. The authors cited above concluded that due to the lack of satisfactory structures and other considerations there is little likelihood of finding oil in that section. Other wells have been drilled since their report was published, but up to the present time no petroliferous horizon has been found. More careful preliminary surveys than have previously been made may disclose satisfactory structures on which to drill, but in general it is felt that any considerable degree of optimism is unwarranted.

References: "Petroleum and Natural Gas Possibilities in Georgia," T. M. Prettyman and H. S. Cave—Georgia Geological Survey Bulletin No. 40, 1923.

HUNTERS RESPONSIBLE FOR STARTING FOREST FIRES

With the opening of the hunting season, the danger of forest fires increases. Two sources of fire from hunters are discarded cigarette and cigar stubs, and warming fires.

The discarded cigarette and cigar stubs should be mashed into the ground with the shoe heel, and observation should be made that the fire they hold is completely put out, and in view of the possibility that the fire is not completely obliterated, notice should be taken that no combustible matter is in contact with the stubs.

The warming fire is a frequent cause of fires. When they are abandoned, the hunters should drench the fires with water, but if water is not convenient, then cover the embers with dirt and drag away from the fire any materials that would carry fire. A few embers of a burned out fire may not appear to be threatening, but a wind may arise to blow them into the leaves or grass and fan the sparks into a flame.

No fire ever burned through a forest without doing harm to the trees; that has not reduced the fertility of the soil on which the trees must depend; or has not reduced the water holding capacity of the soil and lessened the water supply on which trees depend for their full growth; or has not destroyed seedlings on which the existence of the future forest depends. When one starts a forest fire, he is responsible for the destruction of forest wealth.

Trowbridge Resumes

Naval Stores Work

K. S. Trowbridge, Extension Forester in South Georgia, with headquarters at Tifton, has resumed work on naval stores distillation, as a co-operative agent of the Bureau of Chemistry and Soils, the Agricultural Extension Service of the State College of Agriculture and the Georgia Forest Service. Among his duties will be the introduction of government improve-

ALBANY FOREST FIRE PREVENTION PARADE

C. C. C. Boys Present Impressive Demonstration Showing Importance of Forest Fire Control

Headed by City Fire Chief D. S. Brosnan and District Forester H. D. Story, Jr., a C. C. C. camp parade planned by Camp Superintendent Eitel Bauer, put on an impressive demonstration Friday, October 13, at Albany in the interest of forest fire prevention. The forest fire demon was attired in red; appropriate floats and placards portrayed the evils of the forest fire demon and the benefits of fire control.

The parade had seven units. The first one represented "Fire Protection Preserves Forest Products." Forest products were shown—turpentine, lumber, stave bolts, cordwood, paper, building materials, cross-ties, charcoal and rayon.

The second unit legend was "Protect Young Forests—Our Children Will Need Wood." Children paraded in this unit.

The third unit showed modern fire detection methods—fire towers, telephone lines, etc.

The fourth unit represented plans for fighting fires.

The fifth, entitled "We Fight the Blaze," was presented by men carrying fire swatters, portable pumps, etc.

The sixth unit, "We Feed the Fire Fighters," showed an army truck carrying supplies to fire fighters.

The seventh unit showed the fire over and men enjoying themselves with guitars and harmonicas in their tents.

FORESTRY ASSOCIATION STRENGTHENS ORGANIZATION

The Georgia Forestry Association has been conducting an active campaign for strengthening the organization. An important phase of the undertaking has been the selection of county chairmen. A number of counties now have such chairmen who have accepted and have indicated the willingness to promote the policies of the Georgia Forestry Association.

The county chairmen are prominent and influential citizens whose activities may mean much for the cause of forestry in their respective counties.

The development of this new phase of the association has been carried on by C. B. Harman, Atlanta, Chairman of the Executive Committee.

ments in distillation of naval stores. His previous work in this capacity has proved very helpful and is highly appreciated of the naval stores interests of South Georgia.



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STATE PULP AND PAPER RESEARCH PLANT LEASED

**Industrial Committee of Savannah
Lessee with Dr. Charles H. Herty
in Charge — Chemical Founda-
tion, Inc., to Finance Operations**

The Georgia Pulp and Paper Laboratory at Savannah, operated under the direction of the Commission of Forestry and Geological Development for nearly two years, was leased on November 1 to the Industrial Committee of Savannah until January 1, 1936, the state no longer having funds for continuing the plant.

Funds for operating expenses and the purchase of new equipment for broadening the research work have been very generously contributed by the Chemical Foundation, Inc., of New York, which places \$105,000 at the disposal of the Industrial Committee of Savannah for the years 1934-35 and has promised support for 1936 should it be necessary to continue investigations. It was the Chemical Foundation, Inc., that provided funds for equipping the laboratory, making possible the inauguration of the project in the first place.

Dr. Charles H. Herty, who has been directing the research work of the laboratory for the past two years, and whose project has been from its inception, is to continue in charge. His achievements in solving important problems of making newsprint from southern pines have centered the attention of the paper making industry upon the South as a future source of wood pulp.

Speaking of the donation and future plans, Dr. Herty says: "These funds pledged by the Chemical Foundation, Inc., through its president, Francis P. Garvan, to the Industrial Committee of Savannah, assure the continuation of the research work in our laboratory for the next three years. These amounts will enable an extension of the research work to all fields of white paper manufacture, such as book, magazine, bond and tissue papers, bleaching studies, coating of paper and study of alpha cellulose from young pines as a base for the manufacture of the various forms of rayon."

The Chemical Foundation, Inc., was formed under authority of President Woodrow Wilson to free the United States from dependence upon foreign countries for its

chemical supplies. Pulp, paper and cellulose industries have not yet received this independence. Dr. Herty has been closely associated with Mr. Garvan and has labored side by side with him for the economic independence of this country. Dr. Herty's proposal to make this country self sufficient in paper making has received, as has been indicated, material and enthusiastic support of the Chemical Foundation, Inc.

It is the understanding that the results of any experiments made at the laboratory under the management of the Industrial Committee of Savannah will be for the free use and benefit of the general public of the United States.

Department Quarters Changed at State Capitol

Because of the increased work in the Division of Forestry incident to the Civilian Conservation Corps work, additional room has been required. As a consequence, the Division of Geology and the Division of Forestry have exchanged quarters in the State Capitol, and a room which has been used by the Department of Entomology has been turned over to forestry, giving the Division of Forestry three connecting rooms. In addition, a room has been improvised on the gallery of the Senate Chamber and is occupied by the educational and accounting force of the Division of Forestry.

Forestry now occupies rooms 434, 435, 436 and 428. The rooms occupied by Geology are 425 and 426.

Richard W. Smith Acting State Geologist

The Commission of Forestry and Geological Development designated Richard W. Smith, assistant state geologist, as acting state geologist following the death of State Geologist S. W. McCallie.

Mr. Smith has been assistant state geologist for seven years and is familiar with the duties he has assumed. The appointment will be effective until the Commission of the Department of Forestry and Geological Development selects Mr. McCallie's successor.

Sawdust made from sawing pines is now of economic importance in producing ethyl, or grain alcohol.

CORN-PINE RECORD RENFROE EXPERIMENT

**Third Annual Record of Pines
Grown in Connection With Corn
near Quitman — Remarkable
Growth Shown.**

Marion Renfroe living near Quitman, Georgia, began an experiment in growing pines and corn together in 1931 and now has the record of three seasons' results.

Longleaf and slash pines were planted January 27, 1931, and the first planting of



**Cultivated Pines With Three Seasons'
Growth**

corn was made on the land March 20, 1931. After all expenses of planting, cultivation and harvesting, taxes, etc., were deducted, a net profit of \$3.42 resulted. Thus the cost of growing the pines was covered and the pines made more than the usual rate of growth.

The second year in corn again netted a

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K. S. Trowbridge, Tifton

corn profit; the trees made rapid growth and the carrying charges of pine growing was nil.

The purpose of this article is to give the record of the third season of corn production and growth record of the pines.

Marion Renfroe kept temperature and rainfall records. In February the maximum temperature was 92, minimum 19; March 88 maximum, minimum 34; April maximum 85, minimum 44; May maximum 95, minimum 58; June maximum 104, minimum 53.

The rainfall for each month was: February 7.20 inches; March 2.40; April 7.97; May 2.05; June 2.37; July 8.62; August 5.72; September 3.95.

Methods of cultivation employed were as follows:

February 25, cut vegetation with stalk cutter; slabbed off row between pines, leaving balk; split balk with large sweep; threw back two furrows.

March 24, reopened furrow and planted corn on list.

April 7, barred off corn with four-disk cultivator. Sided corn with small sweep. April 22, put dirt to corn with half shovel and sided with 18 inch sweep.

May 13, sided corn with 24 inch sweep.

June 3, sided corn with 24 inch sweep, final.

GROWTH RECORD OF PINES

Slash Pine

Average height October 25, 1933, 110 inches compared to 48 inches June 21, 1932. Some specimens are 137 inches high.

Average diameter (10 inches above ground) October 25, 1933, 2 3/4 inches compared to June 1, 1932 of 1 inch. Some specimens were 3 1/2 inches.

Longleaf Pine

On June 31, 1932, the longleaf had shown no increased growth other than in foliage.

On October 25, 1933, the average height was 4 feet and 2 inches. Some specimens had grown to 7 feet in height.

The average diameter (10 inches from the ground) on October 25 was 3/4 inch, some specimens attaining 1 1/2 inches.

As was to be expected, slash pine has made much more rapid early growth, but longleaf has shown rapid pick up for the third growing season.

COSTS AND RETURNS 1933

Renfroe's financial statement for 1933 is as follows:

Labor expense, cultivation 50 cents per day per man	\$.90
Seed corn at \$3.00 per bushel	.15
Taxes	.44
Expense gathering corn (3 bushels)	.08
	\$1.57
Corn crop returns, 3 bushels at 60c	1.80
Net Profit	\$.23

As will be observed, the corn yield is low, but according to expenses as charged by Renfroe, the pines are still without carrying charges. No fertilizers were used, as is usually necessary to get profitable returns from corn from that type of soil.

Corn will be planted another year and may be fertilized. The trees are getting large, as shown by the illustration, and are competing severely with the corn. It remains to be seen how much longer corn can be grown on the land with any profit or to reduce costs to be charged against the growing pines.

FOREST CONSERVATION OBJECTIVES OUTLINED

In his address before a conference on lumber and timber products, held October 24 in Washington, Secretary of Agriculture Wallace made this significant statement about "Conservation and sustained production of forest resources":

"With resources such as forests, where the capacity for sustained production has already been reduced below requirements, conservation may also involve the building up of productivity above existing levels. Specifically, in the case of forests, the objectives of the law can be accomplished only if these are handled in such manner as to: (1) Avoid unnecessary destruction of usable timber and young growth; (2) insure prompt and adequate regeneration following cutting; and (3) produce a reasonably steady output of timber and other products continuously from year to year, with only such fluctuations as may be dictated by the requirements of the market."

U. S. FOREST CHIEF NATIVE OF GEORGIA

F. A. Silcox, native of Columbus, Georgia, became Chief Forester of the United States November 15, succeeding R. Y. Stuart, whose death occurred October 23.

Mr. Silcox was born December 25, 1882, graduated in 1903 at the College of Charleston, Charleston, S. C., and studied forestry at the Yale School of Forestry, where he obtained a degree in 1905.

He entered forestry work as ranger on the Colorado Leadville National Forest, shortly thereafter being transferred to the Holy Cross National Forest and then to the San Juan and Montezuma National forests to establish administrative organizations.

He was transferred to Missoula, Montana, in 1908 and made associate district forester and then became district forester for the Northern Rocky Mountain region.

At the outbreak of the World War he entered the forest engineer's branch of the American Expeditionary Forces as captain and was later promoted to the rank of major. After a year's service in this capacity he was selected by the Secretary of Labor and the Shipping Board to handle labor problems at the shipyards at Seattle, Washington.

Following the war, he went to Chicago as Director of Industrial Relations for the commercial printing industry of the New York Employing Printers' Association, which position he left to become chief forester.

Mr. Silcox is a member of the National Forest Policy Commission and the Society of American Foresters.

ATLANTA PAPERS USE PINE PAPER

The November 20 issues of the Atlanta newspapers were printed on paper made from southern pines which had been provided by the pulp and paper laboratory at Savannah operated by Dr. Charles H. Hert and his coworkers.

The paper met every test of whiteness ready absorption of ink shown by clearness of print of type and engravings; strength of fibre, and measured up to any similar paper made from red spruce.

Practical demonstrations, as well as laboratory tests have thus shown that young southern pines can be used for making newsprint paper, and it is claimed that such paper can be made more cheaply in the south than elsewhere.

The Brownlee Manufacturing Company has moved its headquarters from Chattanooga, Tenn., to Cedartown, Georgia. A mill of this company is operating near Cedartown.

NEW PINE CANKER APPEARS IN SOUTH

Destructive Fungus Revealed Widely Scattered Infecting All Species of Pines—Federal Inspection in Progress

Pine canker (*Atropellis Pinicola*) is widely scattered in the southern pine belt, according to J. D. Diller, forest pathologist of the Bureau of Plant Industry at Washington who has made an extended investigation throughout the southern states.

Previous to this investigating trip, the presence of the disease was not suspected in the south. Its occurrence had been noted on a few pines of the north and west and had not been given enough attention to receive a name until about a year ago.

Cankers of other and less destructive kinds have been found on pines of the south, but how long this more dangerous kind has been here, how much damage it has done or is capable of doing, the pathologists do not know. Nor have they yet learned what methods of control should be employed.

The fungus eats into the cells of the wood, attacking structure under the cambium layer. In its efforts to continue functioning the cambium develops rough galls but is ruptured and destroyed by the disease. Twigs are readily attacked and killed apparently by the girdling effect of the canker.

Samples collected by Mr. Diller in Georgia, show in some instances the rupture of the bark along the limbs for quite a distance; in other cases the canker has eaten deeply into a more restricted area.

The first steps taken are to inspect the state tree nurseries to see if the disease is present or near by. Mr. Diller is being allowed the use of CCC men for carrying out sanitary measures in and around state tree nurseries. This consists of removing and burning infected trees and seedlings, and spraying.

Mr. Diller was unwilling to predict, in view of a lack of scientific data, how destructive the canker may prove to be, but thus far it would seem that it is capable of doing severe damage. He has found the disease on all species of pine in the south. Studies thus far made fail to reveal that the vigor of trees has any effect on the disease. It is apparently equally adapted to trees of vigor or lack of vigor. Nor has it been found that site, whether mountain or low lands, dry land or swamp land, has any effect. In keeping with the habit of all fungi, wet weather is more favorable to the development of the canker than dry weather.

As to whether the eradication of the disease could be carried on by CCC camps, Mr. Diller said that apparently the canker is widely scattered and only a cursory survey has thus far been made. In view of this situation the only steps authorized are to keep it out of the tree nurseries and to keep it from being disseminated from such sources.

Tree plantations are being inspected to see if the disease has appeared there and to remove and burn infected stock.

TREE INJECTIONS FOR INSECTS AND DECAY

Interesting studies are conducted by the Appalachian Forest Experiment Station on the effect of poisonous solutions injected into the sap stream of trees for the control of insect borers and for prevention of decay in wood after it is harvested.

Several poisons were used for control of the southern pine beetle. A statement of results obtained is that the experiments indicate that for trees up to 6 inches in diameter and 35 feet high (the average size attacked) both the egg and the parent adult stages of this beetle could be killed with as little as 3 grams of sodium arsenite, 10 grams of fluoride, 10 grams of mercuric chloride or 12 per cent solution of pyridine. In a few instances kills were obtained with lower dosages, such as 1-2 gram of sodium arsenite.

In the wood preservative treatment with injections into the sap stream, pine, oak and hickory treated during 1931 were found to be well preserved after one year's time.

Similar tests made in 1930 when one to two ounces were injected, similar results were obtained. The chemical giving best results was mercuric chloride. Logs containing this poison were found to be in a perfectly sound condition with tight bark, bright sapwood and unattacked by insects or fungi, regardless of whether the trees were left standing or were felled and buried half their length in the ground.

Treatments with zinc arsenite and sodium arsenite were also quite promising.

EFFECT OF WOODS BURNING ON RUNOFF

The Appalachian Forest Experiment Station at Asheville has tested the runoff of rainfall on several forest types when burned, and checked against unburned plots.

In the 12th annual report of the station it is stated that it is apparent that old field pine stands effectively control excessive surface runoff of precipitation, and that wherever fields abandoned for agriculture present a serious erosion and flood menace, the establishment of pine on such lands offers a practical control. On an oak-pine area from which the litter has been removed the surface runoff amounted to from 10 to 20 times more than from the adjacent check where the forest floor remained undisturbed.

"Under the nation's new deal, the possibilities for forest development challenge the imagination and we will go forward on a great national program with renewed confidence and increased energy." — George D. Pratt, president American Forestry Association.

RESOLUTIONS OF COMMISSION ON DEATH OF MR. ROBT. E. PRICE

The members of the Commission of the Department of Forestry and Geological Development of the State of Georgia, along with his many other friends, were greatly shocked to learn of the untimely death of our esteemed colleague, Mr. Robert E. Price, which occurred on Sunday, September 17, 1933.

His knowledge of the scope and activities of this department and his practical experience with many phases of the work rendered him a valuable consultant and a safe advisor. Coupled with these attainments was a genial and enduring personality which attracted and preserved a host of friends.

The State of Georgia has lost an able and willing public servant and a patriotic citizen.

We extend our sincere sympathy to the bereaved family, and the Secretary is instructed to record this testimonial in the minutes of the Commission, send a copy to Mrs. Price and publish in the next issue of the Forestry-Geological Review.

NEW AGRICULTURAL VOCATION SCHOOLS

New rural consolidated high schools having agricultural teachers who will teach forestry, establish school forests and co-operate with the Georgia Forest Service in forestry work are as follows:

Bowdon High School, Bowdon, E. E. Duncan, teacher; Damascus High School, Damascus, J. E. Leger, teacher; Dooly County High School, Vienna, B. O. Fry, teacher; Evans High School, Evans, W. A. Smallet, teacher; Mt. Pleasant High School, Climax, Furman Grant, teacher; Roopville Consolidated High School, Roopville, H. H. Gibson, teacher.

Lumber for C. C. C. Camp's Winter Quarters

Between 250,000,000 and 300,000,000 feet of lumber were used in constructing winter barracks for 300,000 men employed at the 1,466 C. C. C. camps in this country. The approximate cost was \$25,000,000.

In addition to the lumber, approximately 26,000 doors and frames and 175,000 window sash and frames were required, involving a cost of lumber and mill work approximating \$10,000,000.

Forests are not a passing fancy in the use of land, but they are entitled to their own rights and on their own merits to occupy permanently, and without the constant threat of being destroyed, a legitimate share of our land.—E. A. Sherman, Associate Forester of the U. S. Forest Service.

QUESTION BOX

Can trees be killed successfully with chemical poisons?

Sodium arsenite is used successfully for killing trees and has proven better than girdling in that it tends to prevent sprouting from stump and roots.

The sodium arsenite is injected into the tree with an appliance made for the purpose, but it can be introduced into the sap stream by borings.

Is the oriental chestnut adapted to the mountains of north Georgia?

Experiments are in progress on the lands of the branch station of the Georgia Experiment Station near Blairsville in Union county. The test has not gone long enough to be conclusive. The Appalachian Forest Experiment Station reports an increase in mortality from 7 per cent in 1931 to 19 per cent in 1932. Growth has been negligible due, it is thought, to an attack of twig blight. Chestnut blight has attacked very few since the oriental chestnut is resistant to a high degree to the disease.

Does sap come from the ground or is it formed in the tree?

Crude sap is taken in by the roots and consists of water and dissolved plant food obtained from the soil. Elaborated sap is fluid material produced by crude sap acted upon by substances in the leaves. Carbon dioxide of the air is converted into starch by the aid of sunlight and green chlorophyll of the leaves. The elaborated sap moves down the tree even to the roots and throughout the tree structure, as the growth needs of the tree require. The moisture transpired chiefly through the leaves is water that came up from the soil, which having given up its plant food, retires to make room for more plant food moisture to enter from the ground.

A number of pines in various places have dead needles. Examination does not reveal borers. What is the trouble?

The trouble is probably caused by the tip moth, an insect that places its eggs in the bud of the growing pines. The grub hatches out and feeds on the bud and in doing so kills the surrounding leaves. The tip moth has been unusually active this year. No serious permanent results occur. Next season natural enemies may remove the pest and the trees be comparatively free of damage. On account of the erratic appearance of the moth and its comparatively light damage, it is usually not considered practical to employ control measures.

Where bird life is abundant in the forest, forest damage by insects is small or absent.

CONSERVING FOREST SOILS

Leaves and twigs shed from trees contain plant food that originally came up from the soil. The nitrogen in this litter is released into the air when a fire burns through the forest. The mineral elements of plant food in the litter are left on the surface of the soil in the ash.

The rains come and the loose ash is washed off of a surface made bare by the fire. The mineral plant food of the leaves and litter is thus carried into the streams and is permanently lost to the forest soil.

Nothing is truer than the statement that forest fires reduce the fertility of the forest land. Nor is anything more apparent than that to save forest soil fertility and promote the most rapid growth of the trees, fires must absolutely be kept out of the forest.

Those who burn the "rough" to reduce the forest fire hazard are doubtless overlooking the harm they are doing the soil. The soil damage of fire is permanent. It is destroying what should be a well guarded heritage of future generations. The soil's fertility and its ability to grow future timber crops should be of greater concern than the fire hazard.

Fires can be prevented or controlled with less expense than the cost of restoring lost plant food that burning removes from the land.

Help the trees meet their plant food and moisture requirements by protecting them from fire.

VOCATIONAL FORESTER ORGANIZES T. P. O.

Delmas Galbreath, Vidalia, Georgia, who completed his vocational forestry camp course in August, went home and began at once to enlist timber owners in his community in a project to form a timber protective organization. He succeeded in getting owners with 20,000 acres listed for a T. P. O. and ready for District Forester Jack Thurmond to sign up. This is a splendid piece of work for a young vocational forester.

Mr. Galbreath was not only one of the excellent students in the vocational school camp but is an enthusiast in forestry work.

Naval Stores Bulletin

Bulletin 9 of the Florida Forest Service, entitled "Florida Naval Stores", by Lenthall Wyman of the U. S. Forest Service and C. H. Coulter of the Florida Forest Service and Bureau of Chemistry and Soils of the U. S. Department of Agriculture, is an important contribution to naval stores literature. It brings to the reader the latest reports of experimentation and displays a number of excellent illustrations.

Wood chemically treated produces a mash suitable for a livestock food.

STATE TREE NURSERIES SEEDLINGS FOR PLANTING

The state tree nurseries at Albany and Blairsville are now ready to fill orders for planting stock. The seedlings are sold at cost, and the cost is kept as low as possible in Georgia. The quality of the planting stock is excellent at both nurseries. The seedlings are thrifty, with well developed root systems.

The price per thousand of pine (slash, longleaf and loblolly) is \$2.00 cash in advance and shipping charges C. O. D. It takes around 1,000 pine seedlings to plant an acre.

A limited supply of walnut at \$3.00 per thousand and black locust at \$2.50 per thousand are available at the Blairsville nursery. Orders may be sent to the Georgia Forest Service at the State Capitol, Atlanta.

SELECTIVE CUTTING OF WINTER'S FUEL WOOD

Too little attention is given the welfare of the forest in cutting the winter's fuel. Improvement of the forest should be the objective. Removal of weed trees, that is, undesirable species, so that trees of commercial possibilities may have a better chance to grow, is an important consideration.

Thinning is equally important, and in many instances more important. Many parts of Georgia depend upon pines for fuel. Often pines have come in too thick and require some thinning to get the best results. By selecting the most promising trees to leave, the axeman should thin out the remainder for fuel. The result will be that the remaining trees will grow much more rapidly and attain commercial size much more quickly.

Next to fire prevention, selective harvesting is most essential for forestry development.

Beavers Introduced in Appalachians

According to a report of Thomas D. Burleigh in the 12th annual report of the Appalachian Forest Experiment Station, the introduction of beavers on the Biltmore estate in North Carolina by the Biological Survey in 1931 has met with marked success. He says: "If local sentiment continues to protect these animals, they should in time attain their former numbers here. This will not only result in regulating stream flow, and so prevent losses from erosion, but will add a valuable source of revenue to the state from the sale of furs taken under regulated trapping."

Powdered willow bark was used by American Indians for smoking, as well as tobacco.

SECOND DISTRICT

**Everett B. Stone, Jr., Dist.
Forester
Gainesville**

Camp P-69—Commerce

Since the establishment of this camp considerable progress has been made with the work. Approximately 15 miles of truck trails have been completed; 5 miles of foot trails are finished; 9 bridges have been built and 500 acres of fire hazards have been removed. In addition to this, many other minor jobs have been completed.

A crew headed by Lane Lancaster, telephone foreman, is leaving for the mountains this week to cut chestnut poles for telephone lines and lookout towers. Our camp will construct 4 lookout towers and some 50 miles of telephone lines.

Collect Wood Samples

Wood samples of every species of tree in this section are being prepared by the forestry personnel. Forty-three samples have already been collected and are on display at the forestry office at the camp. Some 35 more are yet to be collected.

Vocational Guidance

The efficiency of the camp is being improved and the boys are receiving some very valuable training by selecting boys to do the jobs for which they are best fitted. For example: William Shivers, of Sparta, Ga., showed a special interest in landscape gardening; hence he was placed in charge of a project which offered landscaping possibilities. William is not only getting a big kick out of this, but he is doing a good job of it.

Jack Storey of Jefferson is proving an excellent stone worker. Rock culverts and similar projects are being turned over to him. Many other examples of vocational guidance being put into practice could be given.

First Forest Fire

Camp 69 received its first fire alarm Saturday night, November 11. In ten minutes after the alarm sounded a truck was loaded with boys and fire fighting equipment. The fire was located and put out within one hour in spite of the fact that it was 11 miles from camp. Not a spark showed in the darkness when the fire fighters finished "mopping up". About 5 acres was burned over, little damage being done.

General Reeves, Col. Moorman and Major Colley, all of Fort McPherson, were recent visitors at Camp 69.

Camp P-79—Cornelia

The boys at this camp will be well taken care of this winter. The tents are prepared to make them comfortable during the winter. They are walled from the ground up to the door height and are equipped with Siberian heaters.

The roads and trails under construction at this camp are being completed at a fast pace, and they are good substantial jobs, too.

About 13 miles of road and as much trail has been completed to date. Eleven miles of the road lies on the University of Georgia property near Lula, while the remaining two miles ascend Hickory Nut Mountain, near Tallulah Falls.

Forest Fires

Three forest fires have recently been suppressed by the members of this camp with the assistance of the people living in the community. The three fires burned a total of 125 acres of timber, and required 84 man hours for suppression.

Athletics, Etc.

This camp did not put out a football team, but has a good basketball team in the making and will be hurling challenges soon.

The mess at this camp is unusually fine. All visitors who have dined here want to come back and all of the boys have gained in weight, the average net gain being 11 pounds per man.

Camp P-55—Blairsville

Several fire calls have been answered by this camp during the past week, 250 man hours being expended in fighting fires.

Activities at this camp are progressing nicely, with the brisk fall weather.

On Armistice Day P-55 played Camp F-10 of Aquone, N. C. in a football game and defeated them in a close and hard fought game of 9 to 7. This was the second victory the Neel Gap Wildcats have won over the Aquone Bears, the first game ending 7 to 0. The Wildcats have a 40 man squad out and the spirit of the Roosevelt boys is hot.

Camp SP-1—Indian Springs

Winter quarters for this camp were completed some time ago and the boys are all comfortably housed for the winter, with all the conveniences of home, and in some cases, much better. Good weather has prevailed lately and the work at this camp is being pushed forward rapidly. The museum building, which is being constructed of stone, with a tile roof, is nearing completion. This building erected entirely with CCC labor involves a nice piece of architecture and will be a great attraction when finally completed. It will be used to house a collection of Indian relics.

A great many boys are going out for basketball team at this camp and give promise of interesting games in the near future.

On November 22 the boys will enjoy a lecture by Mr. L. P. Skidmore, Director of the High Museum of Art, on "The American Indian, his derivation and some of his design motifs."

To the extent that it can be carried out, a migratory industry (lumbering) based on speculative exploitation of timber which it did not grow, will henceforth be replaced by a permanent industry based on timber that is grown according to definite plans. Secretary of Agriculture Wallace.

DISTRICT THREE

**C. N. Elliott, District Forester
Augusta**

Prices of Logs Increase

If the price of lumber is an indication of better business for the "new deal", the conditions are improving in the area of Augusta. Number 1 pine logs, over 16 inches in diameter, are bringing \$16 per thousand feet. Number 2 logs at the same market are worth \$8. These prices are for logs delivered at the mill. The grading has been checked and is entirely accurate. The Doyle scale is used.

Pine Seed Crop

Last year the seed crop throughout the Augusta district was heavy. The young trees, especially, from 20 to 40 feet in height, were prolific bearers. This year cones are scarce on all species of pines. The district forester examined many stands in several counties around Augusta, and in all of them found approximately two bushels of cones. These were on old trees.

Drainage of Nixon Forest

It is interesting to note that a ditch for the purpose of draining Nixon forest, not only drained the 100 acres of state land, but approximately a thousand acres of land surrounding it. Through the cooperation of the Central of Georgia Railroad, a culvert at the 124 mile post was lowered several feet. Water, which normally backed up over several hundreds of acres behind this culvert, and bred millions of mosquitoes each year, now flows off freely from the surrounding country, and drains into the Savannah river. A real service has been rendered a number of landowners through this drainage project on the state forest.

Hart County Fire Control

Through the efforts of the Hart County FFF organization, in which the vocational school boys of the county are cooperating, not a single acre of wooded land in Hart county has been burned during the calendar year. This is an excellent record, in view of the fact that fires caused considerable damage in Hart county last year before the organization was formed. The citizens of Hart county seem to have become "Forest minded" to such an extent that they do not have to fight forest fire, for no fires occur.

Forestry Taught in Camps

Each week lectures in forestry are given in each of the camps in the Augusta district. The supervisory personnel of the camps are assigned dates and subjects for their talks. Large numbers attend these classes and much interest is shown in the talks and discussions which follow. These lectures and classes are under the supervision of the camp superintendents.

Local Experienced Men

The new quota of men for the second six months' period of the ECW work includes 51 men who are classed as local experienced men and are taken from the counties and projects where the work is being conducted.

With the new recruits and the local men, the camps are brought up to full strength for the beginning of the second period.

SIXTH DISTRICT

Jack Thurmond, Dist. Forester
Savannah

Camp P-61—Treutlen County

To date, about ninety miles of firebreaks and ten miles of truck trail have been constructed by the camp in Treutlen county. These breaks will average thirty feet in width and truck trails are twenty feet wide.

Two steel lookout towers are now under construction, and will give good coverage to the whole county. Gravel used in the tower piers was obtained free of cost except labor in screening, and the sand was also donated.

Telephone line construction is also under way and the telephone crew has cut, peeled and stacked enough poles to build twenty-eight miles of line or about one thousand poles, which were donated by members of the T. P. O. The entire county has also been covered by a strip survey and mapped.

Camp P-82—Tattnall County

On November 2nd, forty-three members of the CCC with their commanding officers arrived in Reidsville from Cedar City, Utah, where they were working on erosion control. The remaining replacements were sent from Camp Dix, and are composed of men from New York state.

This camp will work on the state prison farm in Tattnall county, and will also carry on fire protection work on the Tar City T. P. O., near Mendes in the same county.

Camp P-57, Screven County

Camp P-57, which has been located in the Augusta district, will be moved over into Screven county for work on the Briar Creek T. P. O., as soon as the quarters are completed. The camp site is located twelve miles east of Sylvania.

Camp P-53—Liberty County

All phases of our protective work, which includes fire breaks, truck trails, telephone lines, and tower construction, is being pushed forward as fast as possible in Liberty county, as the fire season approaches.

Many miles of firebreak and truck trail construction have been completed. Seven and one-half (7½) miles of telephone line are ready and one 100-foot steel lookout tower will be ready within the next few days. We are planning to construct about forty miles of telephone line to connect the three towers tower system in Liberty and Long counties. Over one hundred and fifty acres of timber land have been mapped. Telephone poles were donated by landowners of the T. P. O. and we prospected and found the gravel. The only cost was the screening and washing. All three towers should be completed by December 15th and all telephone lines by January 1st.

SEVENTH DISTRICT

C. Bernard Beale, Dist. Forester
Waycross

T. P. O. Items

The three lookout towers of the Camden County T. P. O. located at Forest View, Kingsland, and Satilla Lodge, were manned the first part of November. The acreage of the Camden T. P. O. has been increased to 194,000 acres, embraces most of the forest land both north and south of the Satilla River, and also Cumberland Island. A few of the members have begun construction of their secondary fire breaks, and it is expected with the two additional towers and telephone lines to be constructed in north Camden, the greater part of the forest lands in the county will be satisfactorily protected from fire this season.

Okefenokee T. P. O. in southwest Ware county is planning to employ a cooperative patrolman at an early date. A number of local wardens living on the area will also be obtained to help look out for fires.

Suwanee T. P. O. with 260,000 acres in southern Clinch and Echols counties, had a recent meeting to plan protective work for this year. Plans call for two additional patrolmen to take care of the additional acreage recently listed. Three towers are now in operation and the Superior Pine Products Company with a caterpillar tractor and five-disc plow has already constructed several hundred miles of secondary fire breaks.

At a meeting of the Wayne T. P. O. recently, plans were made for constructing a wooden lookout tower. Specifications are now being procured for same. Several members are busily constructing fire breaks.

A meeting of the Coffee and Jeff Davis T. P. O.'s was recently held to work out plans for fire protection for this season.

The old T. P. O. centering around Crawley in north Ware county is being revived and it is expected that landowners in that section will become active in fire protection at an early date.

C. C. C. Camp Notes

The "Camp Boys" in this district are getting a full-flavored taste of real fire-fighting, now that the fire season has set in. Recently a call came in from Nashville that they had a fire over that way which the local people could do nothing with. Superintendent T. H. Browne, P-52, Homerville, loaded two trucks of his crack fire-eaters and they mopped up the fire within an hour after their arrival. As a reward, County Agent D. L. Branyan gave all the fire-fighters a pass to the County Fair then in progress at Nashville.

P-68, Douglas, is so anxious not to miss any fires, they sent a truck all the way down to Kirkland to handle a fire in Roundabout swamp. Superintendent Browne, P-52, Homerville, already had a contingent on hand fighting the blaze, so Superintendent Clark's men turned around

and came back to Douglas to be ready for other fires in their own territory.

Work on towers and telephone lines is now getting well underway in this district. Plans are being rushed to get the nine towers approved for this district erected by Christmas.

All of the camps are piling up a considerable mileage of firebreaks each month now. The mass production system has been standardized in this district. Some of the shovels have been worn down. Some of the boys must get their shovels mighty hot digging.

EIGHTH DISTRICT

H. D. Story, Jr., Dist. Forester
Albany

Flint River T. P. O. Meeting

A meeting of the members of the Flint River Timber Protective Organization was held November 16 at the C. C. C. Camp in Decatur county for the purpose of discussing matters of interest in protection.

Talks were made by the district forester, the camp superintendent and the secretary of the organization. The topics of discussion were the erection of a lookout tower, the installation of a telephone system, the employment of patrolmen and the question of cooperative fire fighting.

The members of this organization manifested interest in the work by their attendance and their willingness to comply to the requests of the cooperative agencies.

A strong appeal was made to the landowners to increase their vigilance and cooperate with one another in fire fighting so that the camp superintendent could continue protection work with as little loss of time as possible for fire fighting.

CCC Boys Control Fires

Carelessness on the part of some of the landowners, dry weather and high wind has resulted in quite a number of fires on the Pine Island Timber Protective Organization which has caused considerable loss of time in firebreak construction as every available man was used in fire suppression.

The camp superintendent, with the splendid cooperation of his personnel and the army, has succeeded in getting things well in hand and is expected to resume regular work again.

In spite of the fact that there have been quite a number of fires, they have been confined to small areas and the loss has not been great.

Tree Nursery Ready to Ship Planting Stock

The South Georgia Nursery, located at Albany, is getting ready for the shipping season, which begins about the last of the month of November. Orders for seedlings from this nursery have increased and the demand this year is much larger than ever. It is believed, however, that it will be possible to meet the demand.

(Continued on Page 8, Column 3)

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's

Leading Minerals

Reported by THE DIVISION OF GEOLOGY

SUGGESTIONS TO PROPERTY OWNERS ON PROSPECTING A MINERAL DEPOSIT

By RICHARD W. SMITH,
Assistant State Geologist

The Division of Geology is frequently asked to advise property owners as to the best way to prospect and sell a deposit of mineral on their place. A summary of such advice is given in this article on prospecting. A similar article is to follow on selling a mineral deposit.

The owner of a property that contains outcrops of a commercial mineral should not sit back and expect the world to beat a path to his door to buy it from him. It is his duty to find out what he can as to the modes of occurrence and value of that mineral and the character and extent of his deposit. Not until he has done this will he be in a position to interest a possible buyer of his property or to get a reasonable price for his mineral deposit.

The owner should begin by asking himself if his deposit is near enough a railroad to be worth mining. Minerals such as gold or sheet mica that sell for a high price per pound or smaller unit can be mined at long distances from a railroad. Other minerals, such as manganese or kyanite, that sell for a moderate price per ton cannot be mined more than five or ten miles from a railroad. Low priced minerals, such as iron ore or sand and gravel and minerals that must be manufactured into low-priced articles for the local market such as brick clay, must be on or very close to the railroad.

He should ask himself if there is a sufficient market for his mineral. A brick clay that would be valuable close to a large city with no existing brick plants would be of much less value far from such a market or near a city already well supplied by flourishing brick yards. Georgia has many adjacent deposits of limestone and shale or clay suitable for making portland cement, but the plants now in operation are more than sufficient to supply the demand.

The size and quality of a deposit of mineral that meets the above conditions can only be determined by prospecting. The property owner does not need to prospect the deposit thoroughly. This will be done by the company purchasing the property or leasing the mineral rights. He needs only to do enough prospecting to satisfy himself and a prospective buyer that the mineral is in sufficient quantity and of such a quality as to make a thorough prospecting worthwhile. He should preserve all the samples

that he obtains and should leave the prospect pits or trenches in such a form that they will stay open as long as possible so that prospective buyers can see the deposit and collect their own samples.

The method of prospecting a deposit will depend on the mode of occurrence of that mineral and the individual characteristics of each deposit, such as the size and distribution of natural outcrops and the lay of the land. Minerals occurring in veins or dikes are prospected quite differently from those found in massive bedded deposits. Directions for prospecting every mineral found in Georgia cannot be given here, but an example will be presented of two main types of occurrence.

Prospecting for Mica: Mica or "islinglass" may be taken as an example of a mineral that is found irregularly distributed in veins or dikes. It is practically impossible to thoroughly prospect a mica deposit. Not only are the veins very irregular in length, width, and depth, but the mica is very irregularly distributed throughout the vein and its value depends largely on the size of the flat sheets that can be split from the crystals or blocks. The usual outcrop of mica consists of badly weathered pieces scattered over the top of the ground at one or more places. Prospecting is usually necessary to determine the direction of strike, width, and angle of dip of the vein, and the relative abundance and character of the mica in it near the surface.

The direction in which the vein crosses the property can sometimes be told from the shape and distribution of the outcrops or by tracing the pieces of vein quartz (often called "flint-rock") that usually occur with the mica. It can be more accurately determined by digging through the covering of soil in various directions from the outcrop until both walls of the vein are exposed. Trenches should then be dug across the vein at right angles to the strike at frequent intervals. These need only be dug through the overlying soil and badly weathered vein material to a depth, usually not over 6 feet, necessary to show the character of the vein and the distribution and abundance of mica. The trenches should be of sufficient length to show both walls of the vein. If the outcrop is on a good slope, the lower end of the trench should be extended to give natural drainage. The mica obtained from each trench should be separately sacked and tagged and stored in a dry place.

The pegmatite dikes or veins from which the mica is obtained are also the source of primary kaolin, feldspar and a number of

rare minerals, such as beryl, columbite, and the radio-active minerals. Watch should be kept for large deposits of nearly pure kaolin or feldspar, and any unknown mineral should be saved for identification.

Prospecting for Sedimentary Kaolin: The large deposits of pure white clay or sedimentary kaolin found south of the Fall Line in Georgia may be taken as an example of a mineral occurring in a bedded deposit. The property owner should determine roughly the extent, thickness and quality of the kaolin and the thickness of the overburden that must be removed to mine it. This information may be obtained by two methods:

(1) Boring with a clay auger. This is a rapid and cheap method of determining the thickness of the kaolin and overburden, the extent of the beds, and to some extent the character of the clay. However, the samples brought up by the auger may not be satisfactory for testing because of contamination by the overburden in the upper part of the hole. Furthermore, when the auger is pulled up the ground appears as it did before and no record is left for the next person to see.

(2) Digging a prospect pit or well. This is slower and much more expensive, but is much more reliable because the overburden and kaolin can be seen in place and a large representative sample can be obtained for testing. Moreover, as long as the pit remains open its record is open for all who visit it.

The method that should be followed will depend upon the number and character of the kaolin outcrops on the property. If numerous outcrops show the entire thickness of the bed so that representative samples of fresh unweathered kaolin can be obtained, the only prospecting necessary will be auger holes at intervals between the outcrops and on the slopes above them. These will serve to trace the extension of the deposit and determine the character of the overburden.

More work will be necessary if the outcrops are few and show only the top of the kaolin bed. Auger holes at the outcrops and extending out from them at regular intervals can be used to determine the extent and thickness of the kaolin and the amount of overburden. The borings should be made through or as far as possible into the kaolin. If the borings show the presence of a large body of kaolin, one or more prospect pits or wells should be dug through the kaolin at points where the auger holes showed the thickest and best kaolin to be located. A ditch should be dug on the slope just above the pit and it should be boarded over to keep out surface and rain water.

Remember that prospecting is of little value unless accurate records are kept at the time the work is done. Each auger hole and prospect pit should be numbered. A permanent stake should be driven into the ground nearby with the number on it. The records should give: (1) the number of the auger hole or prospect pit, (2) its location, (3) the thickness of the beds passed

through, both overburden and kaolin, and (4) a description of these beds.

All the borings of unstained kaolin from each hole should be separately preserved, with a label giving the hole number and depth from which they came. All the unstained kaolin from the prospect pits should be placed on a clean paper or cloth as it is removed from the pit and later stored in a dry place, preferably in clean sacks or boxes properly labeled. These large samples can be used to furnish smaller samples to prospective buyers for testing.

Deposits of other minerals are prospected by methods similar to the two examples given above, the details varying with the mineral and the local conditions. The Department of Geology is glad to give further prospecting advice at any time to Georgia property owners. A request for such advice should give the exact location of the property and a detailed description of the outcrop. It should preferably be accompanied by a sample of the mineral.

Next month we will assume that the prospecting disclosed what appears to be a commercial mineral deposit, and will consider the methods to be followed in selling or leasing the rights to mine such a deposit.

SOME OF MANY TRIBUTES TO S. W. McCALLIE

"Without pretense and advertisement, he has rendered years of true and faithful service to the State and has contributed genuinely to its growth and development"—*John M. Slaton, Ex-Governor of Georgia.*

"I greatly admired him and regret exceedingly that it was not possible to keep in closer contact since our student days at Johns Hopkins University. Of him it may be said, 'He rests from his labors, but his works do follow him'."—*E. G. Conklin, head of the Department of Biology, Princeton University.*

"All of us who were connected with the Georgia Survey in any way, realized fully that State Geologist McCallie was a conscientious worker for what he believed to be the best interest of the state he served."—*W. S. Bayley, Geologist, University of Illinois.*

"He was one of my lifelong friends and one of the greatest geologists of America"—*Henry M. Payne, Mining Engineer, Taos, New Mexico.*

"The State has lost one of its most faithful and honored servants; his work was not only a service to this generation, but to future generations."—*L. G. Hardman, Ex-Governor of Georgia.*

"We have taken many tramps together and I always enjoyed his scholarly learning as well as his delightful fellowship. I feel that the State of Georgia has lost one of its

most useful citizens."—*Leon P. Smith, Dean of Wesleyan College, Macon, Ga.*

"Mr. McCallie's long and loyal service to the State of Georgia and to the science of geology have rightly earned for him the high regard in which he was held by us all. He will be greatly missed."—*M. M. Leighton, Chief, State Geological Survey of Illinois.*

"I wish to express my appreciation of a man who lived such a long and useful life. I have always retained a most kindly feeling and pleasant memory of my associations with him."—*H. B. Hopkins, Toronto, Canada, former assistant state geologist of Georgia.*

"The staff of the Georgia Experiment Station extends sympathy. We shared his friendship for many years and are greatly moved at the loss of this great and good man."—*H. P. Stuckey, Director of the Georgia Experiment Station.*

"Everybody who knew him liked him because of his unassuming, kindly personality, and those who knew of his work had nothing but the highest respect for his ability."—*Henry B. Kummell, State Geologist of New Jersey.*

"The engineers of Georgia have all asked much of him these twenty-five years and have always received more than we asked for.

"Speaking personally, Dr. McCallie was one of my father's dearest friends. Since his death in 1929 we have looked to Dr. McCallie for fatherly advice. We cannot express our appreciation of the many kindnesses he showed us."—*B. M. Hall, Jr., Atlanta, president Georgia Section of American Society of Civil Engineers.*

"I enjoyed a particularly warm feeling of friendship for him. He was my first employer after I left Johns Hopkins. To me he was especially gracious and sympathetic and my experience as assistant to him from 1917 to 1920 was the most pleasant I have had in my geological work."—*J. P. D. Hull, Tulsa, Oklahoma, Business Manager, of the American Association of Petroleum Geologists.*

"Permit us to express our very great appreciation for Dr. McCallie's contribution to the geology of the south. His productions will be of great value to the national experiment now being undertaken by the Tennessee Valley Authority."—*A. E. Morgan, Knoxville, Tenn., chairman Tennessee Valley Authority.*

"I admired him for his scientific learning so simply and unostentatiously a part of him and I shall always remember him for his genuine and kindly courtesy and friendliness."—*Ella May Thornton, State Librarian of Georgia.*

Land Classification

In its first annual report, the National Land Use Planning Committee reports surveys of lands of 18 states and progress on 7 other states, with the ultimate purpose of classifying the land areas of the entire United States according to their physical suitability for the principal agricultural crops, including pasture, forage and forests. The report says:

"The importance of land classification for wise utilization of our land resources needs no emphasis, for obviously, it is essential, first of all, to know what the land is good for, and the determination of that is the essence of the classification work."

Improvement Measures For Mountain Forests

An interesting and practical bulletin entitled "Measures for Stand Improvement in Southern Appalachian Forests," prepared by the Appalachian Forest Experiment Station at Asheville, N. C., has been issued as Forestry Publication No. 1, an aid to Emergency Conservation Work in the Southern Appalachians.

Vocational Forestry Studies Outlined

"Analysis of Special Jobs in Farm Forestry" is the title of a bulletin issued by the Federal Board of Vocational Education for use of vocational agricultural teachers in presenting the subject of forestry.

Copies of this bulletin have been placed in the hands of vocational agricultural teachers of Georgia, all of whom have forestry in their courses of study, and school forests on which the Georgia Forest Service conducts practical demonstrations.

The bulletin provides a text for teaching arranged according to the job method used in vocational teaching.

EIGHTH DISTRICT

(Continued from Page 6)

sible to fill all the orders received this year as the seedling supplies have also been increased from year to year.

The stock of seedlings ready for shipment is of a very fine quality and it is expected that practically all of them will live after being transplanted.

An expansion program is being carried out that will enlarge the output of the tree nursery to about twice its former size. With the new seed beds available it is planned to follow those in which the seedlings have been grown for the last two years, in order to prevent contamination of the soil with plant diseases and so that soil fertility may be improved by the application of leaf mold or pond muck.

The caretaker's residence, which is part of the expansion program, is under construction and progress has been made toward its completion. It will be a six-room dwelling of stacked logs with the rustic effect carried throughout.

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FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 4

ATLANTA, GA., JANUARY, 1934

No. 1

HOW FOREST FIRES DAMAGE AND DESTROY

Ignorance and a Torch Destructive Influences at Work in Georgia Woods — Conversion of State's Greatest Natural Resource to Ashes

Those who put fire to the forests are enemies of the public. Since trees are Georgia's greatest natural resource, burning off the forests is the greatest economic crime one can commit against the welfare of Georgia.

And yet there are many land owners in Georgia who in their ignorance burn off their woods in the belief that they are doing themselves a service, or who disregard forest fires under the impression that they are doing little or no harm.

It is up to the enlightened people of the State to carry a message to the last man to dispel ignorance about forest fires, to stay the hand that wilfully applies a torch, and to convince all of the necessity of fighting fire when it accidentally invades the forest.

What are the facts?

Forest fires destroy seeds and seedlings cutting off a generation of trees. Fires prevent natural reforestation.

Fires injure the larger trees by scorching and wounding the bark, by this means allowing decay to penetrate the trunk, and by giving injurious insects an opportunity to invade and kill or damage the trees.

Fires destroy humus forming material of the soil and reduce its nitrogen content, thus imposing plant food hunger and slow growth upon the trees.

By reason of destroying the mulch of forest leaves and litter on the forest floor, forest fires reduce the water storing capacity of the soils. As a result, trees suffer for lack of moisture and since they must have soil water to make sap, their growth processes are slowed down by thirst.

If fires are allowed to burn off the leaves, litter and humus of the forest, the rainfall flows unchecked over the surface, erodes the soil, thus removing the cream of soil fertility; clogs stream beds with gravel, sand and silt, and accounts for destructive floods.

By destroying the ability of the forest

(Continued on Page 2, Col. 3)

RICHARD W. SMITH NEW STATE GEOLOGIST

Assistant State Geologist Succeeds the Late State Geologist, S. W. McCallie — Appointed December 19

Assistant State Geologist Richard Wellington Smith, who has been acting State Geologist since the death of S. W. McCallie, was nominated by the Commission of Forestry and Geological Development on December 19, and appointed by Governor Eugene Talmadge to be state geologist, effective at once.



RICHARD W. SMITH, State Geologist

Mr. Smith had been with the State Geological Survey for seven years, and is, therefore, familiar with the geology of Georgia and with the duties to be rendered. His college training and broad experience places him prominent among the younger geologists of the nation, and a suc-

(Continued on Page 2, Col. 2)

PINE PLANTING STOCK IN HEAVY DEMAND

Tree Nurseries in State Unable to Supply all who Want Seedlings for Planting — Reforestation Interest Growing in Georgia

So great has been the demand for pine seedlings for reforestation in Georgia that the supply grown at the state tree nursery at Albany has been quickly taken up. The demand made on the tree nursery of the State College of Agriculture is also reported heavy with indications that the supply will fall far short of the demand. The limited supply of planting stock, walnut, black locust and pines, at the Blairsville nursery is also in large demand.

This year many large orders have been placed, indicating that land owners are going in for planting on a large scale. Pine plantations appeal to many as the best way to use abandoned crop lands of which there is a vast area in Georgia.

Doubtless many will be disappointed in not getting nursery seedlings for planting. While nursery grown seedlings are better, good results may be obtained by the use of wild stock. Care should, however, be taken to plant only small plants, preferably one year old stock. If fairly large pines are used, many will not survive transplanting. More digging will be required to get the plants up and deeper holes will be necessary for planting the larger stock. Therefore, the expense is much greater when larger stock is transplanted than when small stock is used.

Those who are compelled to use wild stock should dig up the plants carefully so as to retain the root system intact. As soon as dug up they should be placed in a tub containing water, so as to keep the rootlets from drying out. They should be set in the ground as soon as practicable. Care should be taken not to cramp or twist the tap root. Firm the earth around the roots so that there will be no air pockets left in the soil.

Planting in south Georgia may be carried on in the fall or late winter and early spring. In the upper half of the state, it is better to plant in late February, or in March.

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FOURTH YEAR—VOL. 4, No. 1

The Forestry-Geological Review and its predecessor, Forestry Lookout, have appeared for three consecutive years. This issue is Vol. 4, No. 1.

Approximately 4,000 copies of this publication are circulated monthly. Among those receiving it are lumbermen, naval stores interests, leading timber owners, many of whom belong to the timber protective organizations of Georgia, vocational agricultural teachers who are teaching forestry in rural high schools, members of the State Legislature, county agricultural agents, chambers of commerce, libraries, county commissioners, county school superintendents, newspapers, mining and quarrying interests, and miscellaneous.

The editor is grateful for expressions of appreciation about the Review, and is encouraged to believe that the publication is rendering service to the cause of Forestry in Georgia.

To all readers, best wishes for a Better New Year!

Editor.

Susceptibility to Storm Damage

In studying effects of a 56 mile an hour storm on a national forest near Ely, Minnesota, authorities of the Lake States Experiment Station report that damage according to species was in the following order: Spruce (black and white), aspen, Jack pine, paper birch.

RICHARD W. SMITH

(Continued from Page 1)

Successful promotion of the geological interests of Georgia may be expected under his leadership.

The new state geologist is 35 years of age. He received the degree of Bachelor of Science from the Massachusetts Institute of Technology and his Masters degree from Cornell University, where he specialized in economic geology and petrography.

Mr. Smith's experience in geology began in Tennessee, where, as assistant state geologist, 1921-1925, he made notable studies of the phosphate deposits of middle Tennessee, resulting in several valuable reports. Because of his knowledge of Tennessee phosphates, his services were recently sought by the Tennessee Valley Authority for several months work on some of the lower grade phosphate ores hitherto unmapped.

The services of Mr. Smith as assistant state geologist of Georgia were sought and obtained in 1926 and since then he has worked on the mineral deposits of this state, giving special attention to kaolin, bauxite and fuller's earth deposits in middle and south Georgia, his findings being published in Georgia Geological Survey Bulletin 44, and to shale and brick clay deposits in middle and northeast Georgia, the results being published in Bulletin 45. He has also been at work on mica and feldspar deposits of middle and northeast Georgia, now about three-fourths completed, and has made shorter investigations of a number of other minerals.

Mr. Smith was married in 1930 to Miss Katherine Cox, daughter of Dr. Ross P. Cox, of Rome, Georgia.

Price of Wood Imports Fixed By Code Authorities

The Federal Lumber Code Authority has ruled that imported woods shall not sell at any delivery point in the United States at prices below "minimum cost—protection price" of similar items of domestic origin. The code authority determines domestic cost and estimates "protection".

These measures are designed to give woods producers of the United States an opportunity to meet severe foreign competition.

Pine Canker Control In Treutlen County

Pine canker in recent months found to be widely prevalent in the southern pine belt, as discovered by J. D. Diller of the United States Bureau of Plant Industry, has received attention in Treutlen county. Under the direction of Mr. Diller, the C. C. C. boys have spent some time removing diseased pines and burning them as a measure of disease control.

FOREST FIRES

(Continued from Page 1, Col. 1)

soil to impound water, the size of the constant flow of springs, wells and consequently of streams is reduced. As a result, the amount of available water power is lessened.

Forest fires destroy the food of game birds and of wild life in general, often killing them outright. As a consequence, forest fires mean less game.

Fires mean more clay in the streams, fewer fish and less desirable species of fish. Heavy washings of ash from burned-over woods into streams is harmful to fish.

Fires usually kill out some of the most valuable native grasses, leaving only the inferior, thus reducing the grazing value of forested lands.

Some Fallacies of Woods Burning

Some people still believe that burning off woods kills cotton boll weevils. Since weevils do not hibernate on the ground, the forest fires kill no weevils.

In South Georgia especially, burning off the dead sedge and wire grass is supposed to improve grazing, whereas fires of usual intensity kill out the best grazing grasses and leave only the poorest tuft grasses, the sedge and wire grasses.

Turpentine operators rake around trees and burn off the forest to keep fires from reaching the cups and faces on the trees, whereas firebreaks and a patrol system recommended by state and federal authorities cost less, are even more effective in fire control and half of the cost of such protection is paid by the state with federal funds. Raked and burned turpentine orchards yield less gum than those not burned over.

Hardwood Fire Injury Varies With Species

Reporting studies of fire injuries to hardwoods in the Natural Bridge National Forest, members of the staff of the Appalachian Forest Experiment Station at Asheville, N. C. report in the November 1933 issue of the Journal of Forestry, that of the species studied yellow poplar suffered least, scarlet oak most, with black white and chestnut oak intermediate, their relative order depending on diameters.

The area studied was severely burned over April 10 and 12, 1930, the fire growing in intensity as it reached the crests of the ridges, completely destroying the stand on some crests and upper parts of slopes.

National Forest Plantings

According to the U. S. Forest Service, more than twice as many acres have been planted to trees on national forests in 1933 as for the previous year, as many as 48,000 acres being planted in the fall of 1933, with full reports for the year not having been received. In 1932, 24,900 acres and in 1931, 26,000 acres were planted on national forests.

MANY FOREST FIRES DURING DROUTH PERIOD

C. C. C. Men Have Done Excellent Fire Suppression Work in Regions Around Their Camps

Georgia is in the midst of its forest fire season. Outbreaks were favored in the fall by the long drouth. In areas where no attempt was made to prevent or control forest fires, much damage has been done. The forest debris was dry, easily burned and the flames so high and hot as to kill all small pines, some fairly large ones, and did considerable injury to large trees.

If the men of the C. C. C. camps had not been available for forest fire duty in some areas, the damage would have been much heavier and more widespread. In areas several miles around each camp the burned acreage is comparatively small, thanks to forest workers. District foresters speak highly of the willingness and hard work of the C. C. C. men in combatting fires, and of their increasing efficiency as fire fighters.

The firebreaks constructed by the C. C. C. men have demonstrated their efficiency wherever an outbreak has occurred. These C. C. C. firebreaks are 25 to 30 feet wide, cleared of trees and shrubs, and plowed.

The lack of rains in the fall, of course, not only increased fire hazard, but it has lengthened the fire season which usually reaches its peak and its end in late winter and early spring when farmers begin cleaning up and burning field litter preparatory to plowing. The season's fire record is, therefore, not estimated until after farmers have plowed their lands.

FORESTRY GRAZING STUDIES, TIFTON EXPERIMENT STATION

A project involving a study of a combination of forestry and pasture is being carried out at the Coastal Plain Agricultural Experiment Station at Tifton. Director S. H. Starr of the Station has obtained the use of a group of C. C. C. men to thin and improve the forest area to be used.

Carpet grass and lespedeza will be the main pasture grasses to be used. Fire breaks are to be established, sown to grass and grazed closely to make the fire breaks effective in forest protection, and when the pines have so thoroughly covered the land as to suppress grazing, the firebreaks will continue to be used.

The value of the pasture will be calculated as well as harvested timber, in an effort to develop the economy of growing timber in combination with grazing.

The Atlanta Terra Cotta Company, Glenn Building, Atlanta, and 19 West 44th Street, New York, has issued a book entitled "Chimney Pots of Atlanta Terra Cotta" in an effort to popularize this type of construction which has so long been an attractive and efficient part of chimneys in England.

RESOLUTION ON DEATH OF STATE GEOLOGIST S. W. McCALLIE

At a meeting of the Commission of the Department of Forestry and Geological Development, held on December 19, the following resolutions respecting State Geologist S. W. McCallie, who died October 26, 1933, were passed:

This Commission records with regret and a sense of great loss to the Department and the State of Georgia, the death of Mr. Samuel Washington McCallie, State Geologist, which occurred suddenly at his home in Atlanta at nine o'clock in the evening of Thursday, October 26, 1933.

Mr. McCallie came to the Georgia Geological Survey in 1893 as assistant state geologist and was elected state geologist in 1908. His forty years of service have been discharged with satisfaction to the state and with distinction to himself. During this long period, he was the author of 63 scientific books and papers dealing with the resources of Georgia. These publications have been widely circulated throughout this country and abroad.

Co-incident with this remarkable record is the creditable and practical fact that there has been a steady and ever increasing development of our mineral deposits.

To his associates and friends, his life and bearing were characterized by modesty, kindness and a conscientious fidelity to duty.

The Commission extends to Mrs. McCallie and the other members of the bereaved family their deepest sympathy, and the Secretary is instructed to send a copy of this testimonial to Mrs. McCallie, record it in the Minutes of the Commission, and publish it in the next issue of the Forestry-Geological Review.

ROOSEVELT SEEKS ANOTHER YEAR FOR C.C.C. WORK

According to press information, President Roosevelt will ask Congress to continue Emergency Relief Work by Civilian Conservation Corps in forestry work for another twelve months.

The work accomplished by the C. C. C. camps has been of immense benefit to forestry but has hardly begun. Another year's work would see much more accomplished than was possible the first year with the organization and preparatory work to be dealt with.

Georgia has an immense area untouched by C. C. C. activities. Another year of work would result in much wider extension of benefits, and put forest fire protection and timber growing into operation on a large scale permanent basis. In fact, another year's work is essential to realize the fullest benefits from the first year's activities.

FOREST SURVEY BEGINS IN NAVAL STORES BELT

Comprehensive Study of Slash and Longleaf to Develop Present and Prospective Timber Resources

With funds obtained through the National Industrial Recovery Act of Congress, a number of timber surveying crews are now employed in the south. Authority for a nation-wide timber survey was given by Congress in 1928, but for lack of funds the work had not progressed far.

The first objective of those in charge of the survey in the south is to survey the timber of the naval stores belt, to develop information along the following lines:

(1) Information as to the total number of turpentine crops now in operation and the various stages of its progress.

(2) The number of trees and faces available for turpentine at the present time, and an estimate of the number of trees that will come into working size in the next ten years.

(4) The amount of saw timber, poles, piling and ties now available for logging, with an estimate of the amount of these commodities available each year for the next decade.

(5) The quantity of pine stump wood now available for use in the manufacture of wood naval stores.

(6) The volume of several suitable species available now for the manufacture of paper pulp and the amount that can be produced annually.

(7) Estimate of the rate timber resources are being depleted by utilization, fire and by natural causes.

(8) Trend as to market requirements for forest commodities and rate of production to be expected from a sustained yield operation of the forests.

The survey in the south is under the general direction of Capt. I. F. Eldredge with headquarters at the Southern Forest Experiment Station, New Orleans. Eight crews were put to work under M. M. Lebras, Lake City, Florida, in Georgia and a portion of Florida. Four of these crews under J. W. Cruikshank are employed in southeast Georgia, and four crews under E. B. Faulks in northeast Florida. Additional crews are to be employed in the North and South Carolina naval stores belt in the near future.

Pine Reforestation

A fallacy prevails that southern soils "turned out" will quickly come back to pines, says the U. S. Forest Service. They did return 20 to 40 years ago, when there were many scattered old "forest" pines which scattered large quantities of seed from their 100-foot high crowns. Today adequate young stands come only along the margins of fields, while on the rest of the land only a few scattered pines and plenty of "weed" trees or broom sedge.

FORESTRY QUESTION BOX

When do Pine Needles Drop?

According to studies made by the Southern Forest Experiment Station on the Olustee Experimental Forest, Lake City, Florida, the heaviest fall of longleaf pine needles is in October; the second greatest is in June. Records show falling of needles every month of the year. Two periods, August, September, October and November being one, and May, June and July being the other, account for a very large percentage of the shedding. December, January, February, March and April show comparatively little shedding, but December and January each show more than any of the five months mentioned as having slight shedding.

What is the Cost of Thinning Young Pine Thickets to a Suitable Stand?

The Southern Forest Experiment Station reports an improvement thinning in southeast Georgia at a cost of 35 cents an acre. The aim was to leave 250 trees per acre on an area where the stand varied from 200 to 2,000 trees. The stand left after cutting averaged 236 trees per acre with tree diameters breast high averaging 4½ inches. The original stand averaged 3½ inches in diameter and were about 19 years of age.

The felled trees were allowed to lie. In a few cases where the tops were large and bushy the limbs were lopped and flattened.

What is Compression Wood?

A definition of compression wood given by the U. S. Forest Products Laboratory is as follows: "Abnormal wood formed on the lower side of branches and leaning trunks of softwood trees. Compression wood is identified by its relatively wide rings, usually eccentric, and its relatively large amount of summer wood, usually 50 per cent or more of the width of the annual rings in which it occurs. Compression wood shrinks excessively and irregularly lengthwise."

What is meant by "dote" in connection with Veneer Logs?

"Dote" is a softening of the wood by decay which may be discolored or merely soft and not discolored. It is also spoken of as "doze". It is a stage of decay which has not advanced to the complete breakdown of the fibre.

Will Cypress Grow Successfully on Dry Land?

Yes, faster than it grows in swamps. Dryland cypress, of course, does not have enlarged butts, or knees, such as they have in swamps. Forest fires have evidently given the cypress no chance to develop

except where it can be protected by surrounding water.

Will Pruning Lower Limbs of Young Pines Retard Tree Growth?

Since needles elaborate growth material, a part of the plant manufacturing growth is shut down by removing limbs. The practice of pruning off lower limbs is considered advisable since considerable growth material is required for developing the limbs that preferably should go into the trunk. The removal of limbs of young trees makes clearer wood and easier chipping for turpentine.

It is considered wiser to leave at least two thirds of the leaf surface of young trees when pruning away lower limbs; later on pruning a second time may be practiced, where advisable.

GEORGIA LUMBER RECORD FOR THE YEAR 1931

The Bureau of Census has recently issued a report of lumber industries for 1931. While Georgia's growing production in 1931 was comparatively low, lumber wood working industries still gave a large number employment and produced values of considerable amount.

The number of active sawmills was 782, turning out 459,617,000 board feet.

There were 378 wood working plants, employing 5,142 at wages of \$2,079,522, with products valued at \$13,141,920.

Planing mills, 95, employed 1,393; value of products \$6,940,742. Box manufacturers, 12, employed 1,042; wages \$497,500; value \$2,848,955. Cooperage, 13 plants, wage earners 157, wages \$102,374; value of products \$1,077,412; Laths produced numbered 4,668,000 and shingles 7,878,000. In veneer production, 29,762,000 board feet of logs were used.

Timber sawed by species and amounts in board feet are as follows: Ash, 3,828,000; cypress 19,682,000; red gum 16,443,000; sycamore, 1,311,000; tupelo 5,170,000; pine 379,868,000; yellow poplar 12,795,000; white pine, 612,000; basswood, 122,000; cottonwood, 413,000; elms, 520,000; hickory 87,000; maple 766,000; oak, 17,379,000; all others, 5,202,000.

Dr. Charles H. Herty Chemical Administrator

Dr. Charles Holmes Herty, director of the Pulp and Paper Research Laboratory at Savannah, and chemist of national reputation, has been made deputy administrator of NRA to have charge of chemical codes. This well deserved recognition of Dr. Herty places at the command of the federal government one trained and experienced to deal with problems of one of the most important industries of the country.

Dr. Herty's new duties will not interfere with carrying forward the program of research at the pulp and paper laboratory at Savannah, where he has under him an able body of technicians.

CONSERVATIVE CHIPPING GIVES HURRICANE INSURANCE

In the Naval Stores Review of December 2, Lenthall Wyman, Lake City, doing naval stores investigations for the Southern Forest Experiment Station, reports hurricane damage on forests turpentine conservatively by the government method as compared to damage done to trees turpentine according to ordinary commercial methods.

The plots were comparable in every particular except as to chipping methods. On the commercial tract, the trees had been faced in 1923 and back faced in 1925. Chipping about 1 inch deep with heavy slabs of wood removed when cups were installed. The area, 2.4 acres on a lake shore, had 367 trees and suffered a loss of 37 trees or 10 per cent.

On the experimental tract alongside, operated by the U. S. Forest Experiment Station, there were 550 trees. Chipping was shallower than that of the commercial orchard and no trees were worked with two faces concurrently. In 1923 550 trees were faced, and back facing began in 1928, '29. Cuts for installing tins were held down to a minimum and tins were tacked on to the faces when raised. Only 7 of these trees were broken by the storm, or 1.3 per cent as compared to 10 per cent on the commercial tract. Mr. Weyman says:

"These records amply justify the claims of the Southern Station that it is important to avoid exposing wood below the tins when installing cups, to avoid deep incisions in the face when raising tins and to take every precaution to treat timber conservatively so as to reduce dry facing and keep insects and rot from gaining access to the trees.

"The serious effects of poor turpentine practices do not always show up immediately in lowered gum yield and higher mortality but are evident whenever drought, or high winds take their toll of the weakened trees."

New Resin Product

The Hercules Powder Company, Wilmington, Del., announces the development of a new product known as Vinsol Resin No. 1, a hard, black, tough, oil-resistant resin, valuable for use in many types of insulation, sealing compounds and thermoplastics.

TREE SEED SCARCE

Those who collect tree seed for sale and those who buy seed for tree nurseries were made depressingly aware of a seed shortage in 1933.

Much effort is being put forth to find seed for tree nurseries operated by the state. The possibility exists that not enough will be found to supply the nurseries with the usual amount.

LUMBERING UNDER CODE. ALLOTMENTS, WAGES, PRICES

Large and Small Sawmill Operations Under Control—Production without Authority Penalized

A number of inquiries have been made of the Georgia Forest Service by small sawmill operators in Georgia as to what they should do to obtain permission to saw timber. The Georgia Forest Service has no authority in the matter; it had no part in formulating the code, nor is it assigned any duties in carrying out the regulations of the code. The Georgia Forest Service is, however, glad to be of service in putting sawmill operators in touch with proper authorities.

For the information of our readers in Georgia who operate sawmills, it may be stated as a fact that all sawmill operators are under the code whether they have subscribed for it or not. Certain allotments of board feet of lumber cutting are made quarterly to each division of the country, based on an estimate of the requirements with due allowance for stocks in hand. The amount each sawmill operator will be allowed to cut will be determined by local as well as general conditions.

The code does not "fix prices" at which lumber is sold, but it establishes a minimum price that will allow the sawmill man profit in operating under the provisions of the code. The minimum price of lumber fixed by the code is established and will be made known to the sawmill man when he applies for operating authority.

If a sawmill has been cutting timber without authority under the code, he will have to make reparations to square with the code during the period he has operated while the code has been in effect. For instance, if he has not paid the full wages set by the code, he must pay laborers the balance due them. Forty hours per week is the number of work hours permitted.

The object, of course, is to restrict production to consumption, reducing the surplus stock on the yards, to the end that larger returns may be obtained not only to the sawmill operator, but by the timber owner.

To Whom Applications Shall be Made

The Hardwood Manufacturing Institute, Memphis, Tenn. should receive applications of manufacturers of hardwood lumber and forest products, red cedar, yellow cypress and Appalachian hemlock, spruce, fir and white pine in the Appalachian and southern regions.

Those who operate on pine other than white pine or on mixed species south of the Appalachian region should make application to the Southern Pine Association, New Orleans, La.

If anybody is asking you to destroy a part of your tree crop. The satanic fire fiend attending to it.

TRANSPORTATION COSTS ON PULPWOOD FAVOR SOUTH

Much of the red spruce going into newsprint used in the United States originates in Canada. Easily accessible forests have already been cut; supplies are annually becoming less easily obtained in mountain areas, are increasingly further from rail and water transportation to paper mills.

The Journal of Forestry, November issue of 1933, reproduces a paper by A. Koroleff delivered before the Quebec Society of Forest Engineers in which he says:

"Mountain logging is for most of our loggers (pulpwood) a stumbling block because in former years they were accustomed to operate in comparatively flat country and to leave wood on steep slopes as 'inaccessible'. Recently, however, many woods operations have been moved from easy ground into hilly and even mountainous territory."

Transportation, including handling from stump to mill, is estimated by this authority as 40 per cent of the entire cost of pulpwood under Quebec conditions. The items of preliminary preparations, portaging supplies and construction materials into the bush and transportation of workmen and of administrative staff in both directions, and supervision overhead are placed at 20 per cent of the cost of pulpwood, while the cost of wood proper (including stumpage, ground rent, depletion charges, etc.) is put at 25 per cent and cutting cost at 15 per cent.

"With our woods operations very distant from headquarters and scattered over wide areas of our wild country, administration supervision can be only as efficient as are the available means of transportation," states Mr. Koroleff.

Contrast these statements with the situation found in the pine belt of the south where no mountains involve transportation difficulties, where loggers can be found close at hand, obviating the necessity of providing housing and food; where the operating company does not have to construct long truck trails, or chutes; where comparatively nearby are to be found railroads, modern highways and in many parts of the region, navigable streams.

Consider also the south has a year-round climate for working in the woods as against the closed period in the winter in the far north where ice, snow and intense cold prevails and transportation is blocked.

Whereas transportation from forest to pulp mill entails 40 per cent of the cost of the pulpwood in Canada, the transportation cost in the south would probably be less than half that. Cutting would also be cheaper in the south because transportation, housing and food enter into harvesting costs in Canada.

Supervision, equipment and general overhead cost can easily be half that required in Canada where large organizations are required to meet the problems arising from

operations on sparsely inhabited, rough, mountainous country and expensive transportation costs.

The facts developed by Dr. Charles H. Herty and his co-workers that young southern pines of all species are suited to producing newsprint paper as easily as red spruce, associated with comparatively low cost of cutting and transporting pulpwood to paper mills, all point to advantage and economies in manufacture, which the paper mills cannot long afford to ignore.

RESOLUTIONS RESPECTING DR. CHARLES H. HERTY'S WORK

At a meeting of the Commission of the Department of Forestry and Geological Development on December 19, 1933, Hon. J. Leonard Rountree offered the following resolution, which was unanimously passed.

WHEREAS, Dr. Chas. H. Herty has been connected with the Commission of Forestry and Geological Development as Director of the Research Pulp and Paper Laboratory at Savannah, and by his untiring efforts and exhaustive study, he has demonstrated the feasibility of making newsprint paper from Georgia pines; therefore,

BE IT RESOLVED, that the thanks of this Commission be extended to Dr. Herty for his valuable work, not only to our State, but to the entire pine belt of the south; that a copy of this Resolution be furnished Dr. Herty; that it be printed in the Forestry and Geological Review and be furnished to the press; and that our best wishes go with him for his continued success.

FOREST COVER RETAINS OVER 99% OF RAINFALL

That vegetative cover does have a marked effect on surface run-off of rainfall was conclusively proven by experiments at the Holly Springs, Mississippi, Branch Station of the Southern Forest Experiment Station, during the winter of 1931-32. During 70 days of this winter 27 inches of rain fell, of which 62% ran off the surface of a cultivated corn field and 54% ran off the barren soil of an abandoned field. In contrast to this enormous run-off less than 1/2 of 1% of the rainfall ran off the surface of a virgin oak forest and off an unburned native grass plot, and only 2% ran off a scrub oak covered plot. The run-off from the corn field carried with it soil at the rate of 34 tons per acre.—Southern Forestry Experiment Station.

Extension Forester DuPre Barrett recently underwent a serious operation. His many friends will be glad to know that the operation was successful and that he is on the road to recovery.

Resolve to keep the forests free from fire in 1934.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Tar City T. P. O.

During November the Tar City F. F. F. increased its membership and acreage from 5,000 acres and five members to twenty members and 40,000 acres, and consequently, grew into the T. P. O. rating, as having its required minimum of 10,000 acres. It is a forward step for better fire protection in the flatwoods section of Tattall and Evans counties. The land included in the T. P. O. is in one solid body, all connected and will be much easier to protect than if scattered.

The same officers head up the T. P. O., as in the Tar City F. F. F. M. V. Overstreet is President and Waldo Bradley is Secretary and Treasurer. Members of the Tar City T. P. O. have done some good work in protecting their land from fire during the time they were operating as a Forest Fire Fighters' Organization and now since they have become a Timber Protective Organization, they should get even better results.

Plow Demonstration on State Prison Farm in Tattall County

On Friday, December 15th, the Hester Plow Company demonstrated a Hester Two Way Plow and a One Way Plow, on fire break work on the State Prison Farm in Tattall county. Georgia Forest Service officials present included H. M. Sebring, Assistant State Forester and F. L. Edmondson, Purchasing Agent. Mr. Payne of the tractor company was also present along with Mr. Hester of the Hester Plow Company.

The two plows were pulled by a thirty caterpillar tractor. They were given a thorough try out on all types of growth. The two way plow did very effective work in the palmetto and other rough growth and is best suited for work on secondary fire breaks. The officers and several members of the Tar City T. P. O. were present at the demonstration, and were impressed by the work of both plows in fire break construction.

Camp P-57, Sylvania, Ga.

On Friday, December 15th, the personnel and enlisted men at Camp P-57, Burke county, moved into the new camp in District Six, Screven county. The complete moving of all field equipment will be finished next week.

The Screven County Camp is located ten miles east of Sylvania and will work on the Briar Creek T. P. O., which includes some 17,000 acres. All of the camp buildings are finished. The winter quarters here are very comfortable and the men all seem well satisfied with the new camp site. C. B. Ellington is the camp superintendent.

Camp P-61, Soperton, Ga.

Tower and telephone work at P-61 Treutlen county, is going along at a rapid rate. One 80 foot steel lookout tower has already been finished and Tower No. 2 is well under construction and should be ready by January 1st. When the fire season gets under way in full swing, about twelve miles of telephone poles will have been set and the wire and phones will be ready to install before Christmas.

SEVENTH DISTRICT

**C. Bernard Beale, Dist. Forester
Waycross**

Aeroplane Fire Detection

Mr. Tom Alexander, Assistant District Inspector of the U. S. Forest Service, Asheville, N. C., has carried on experiments in this district on the possibilities of using aeroplanes and short wave radio in place of lookout towers and telephone lines for fire detection. We certainly wish Mr. Alexander luck, because it is going to take a lot of something to watch out for fires in the flat woods.

Forest Fire Towers

The nine 100-foot steel lookout towers allotted to this district are under construction. One has already been completed in Ware county, and the crew of experienced steel foremen, working with M. L. Spicer, engineer in charge, are building the two Clinch county towers this week. The entire allotment will probably be ready for service early in February. The towers will be located as follows:

One two miles south of Glenmore in Ware county; one at Withers and one at Anthon in Clinch county; one three miles east of Hoboken, and one two miles west of Waynesville in Brantley county, both on the Brunswick-Waycross highway; one north of Idlewild and one at the Georgia Forest Products camp in Hazards Neck in Camden county; one two miles west of Toledo on the Trail Ridge road, in Charlton county, and one two miles southeast of Baxley in Appling county.

The Wayne County T. P. O. is planning to build a wooden tower to tie-in with the Brantley county towers. Two old T. P. O. towers will be moved to new locations.

The Dupont tower in Clinch county is to be moved about two miles north towards Arabia Bay, and the Forest View tower in Camden county is to be moved east near Cabin Bluff, in order to give coverage to Cumberland island, which was signed up in the Camden T. P. O. last summer.

T. P. O. Notes

A new T. P. O. was formed at Crawley, in northern Ware county Tuesday, December 5. A group of landowners met in the district office and elected officers. The T. P. O. consists of some 50,000 acres around Crawley.

The Brantley County T. P. O. is planning an oyster supper in the near future, with a few songs and other things. T. P. O. business will be boosted.

E. C. W. Notes

Superintendents from all camps in this district met in the Waycross office December 5, and went over E. C. W. work in detail, each getting new ideas from others. The effects of such a meeting are immediately felt throughout the district. The meeting was such a success that others will be held periodically.

The progress made in fire break construction, telephone line, and other activities at each camp, are assembled from the monthly reports, and a copy sent to each superintendent. This keeps each camp informed as to their comparative progress, taking into account the number of man-days worked by each camp over the period covered by the report.

The Douglas Camp, P-68, was abandoned Thanksgiving, the enlisted men being distributed to other camps to fill up vacancies.

One of the C. C. C. boys suggested crossing pines with weeping willows; then when a fire gets too hot, the trees will shed tears of sadness, thereby suppressing the fire.

Okefenokee T. P. O. employed Henry Dean, Vocational Forester, as patrolman or the T. P. O. area southwest of Waycross beginning December 4.

Superintendent T. H. Browne, P-52, is recovering from pneumonia.

Superintendent G. C. Rogers, P-70, who recently fractured an arm in an automobile accident, was returned to the hospital due to complications, but is reported to be satisfactorily recovering now.

Superintendent R. E. Tittle, P-71, has completed telephone connections to the St. George camp on the St. Marys river and long distance communication is now possible with that camp.

**Silt of Flood Waters
Kills Hardwood Trees**

Flood control has an important bearing on the river bottom trees. Silt deposits take their lives.

Observations made by the Southern Forest Experiment Station of one stand of bottom land covered in 1927 by 3 to 4 feet of silt, showed in 1930 that every tree with the exception of cottowoods and willows had been killed. It is estimated that two years is the maximum length of time hardwoods, excepting the two species mentioned, will survive following a deposit of silt or sand of one foot or more.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

SUGGESTIONS TO PROPERTY OWNERS ON SELLING A MINERAL DEPOSIT

By RICHARD W. SMITH
State Geologist

Suggestions were given last month to property owners on the methods to be followed in prospecting a mineral deposit. Let us now assume that a property owner has prospected a deposit of mineral on his place and the results have convinced him that the deposit is large enough and of the right quality to be worth mining.

The next step is to get in touch with a prospective buyer. A complete description of the deposit, including the prospecting records and samples, should be filed with the State Division of Geology and with the Industrial Development Departments of the nearest rail road and power company. Such departments often receive inquiries for commercial deposits of minerals in their territories. A conservative advertisement in the trade journals of that mineral industry or such general industrial magazines as the Manufacturers' Record, Baltimore, Md., and Industrial Index, Columbus, Ga., may help. The Chamber of Commerce of the nearest city may help to find a buyer.

The property owner should always investigate the business and financial reputation of a prospective buyer. An honest individual or company will be glad to furnish banking and other references as to his character and financial ability to handle the proposed terms of the sale or mining enterprise. A little care in this respect will prevent the disappointments that follow dealings with dishonest and "flee-by-night" persons.

The prospective buyer of a mineral deposit will always thoroughly prospect it himself before purchasing the property or the mining rights. He must be given an option before he will start the prospecting. This option should state the time allowed for prospecting, at the end of which the option expires, and should state all the terms of the purchase price if the deposit should prove to be satisfactory. The price paid for the option should be enough to fully compensate the property owner for any inconvenience or damage to his property during the prospecting.

There are three methods by which mineral deposits are sold: (1) land sold in fee-simple for a fixed sum; (2) mineral rights only sold for a fixed sum; and (3) mineral rights only leased with a small cash payment and a royalty of so much per ton of

the mineral mined or a fixed percentage of the selling price of the mineral. Each method has its advantages. With the first two methods, the money is obtained at once and future misfortunes of the purchasing company do not affect the former property owner. Yet, on the other hand, it is very difficult to set a fair price on a property containing a mineral deposit. The investment required for the equipment to mine most minerals and prepare them for the market is large, and few companies can, in addition, afford to invest a very large sum in the raw material. Two or three times the farm land value for the property is probably the most that can be hoped for. Sale of the property in fee-simple is usually to be recommended rather than sale of the mineral rights only. The latter method often leads to endless litigation. The property owner, if the mining enterprise prospers and no more money is coming in to him, is apt to feel that he has been cheated and tries to get his "rights" by damage suits.

The method of leasing the mineral rights on a royalty is apt to bring larger returns in the long run if the mineral deposit is large and the mining company means business. The royalties commonly paid depend upon the value of the mineral, the quality and size of the deposit, the nature and thickness of the overburden, the cost of mining and treatment, and the distance from railroad transportation. The following table gives the royalties commonly paid on some of the minerals mined in Georgia. Many of these figures will seem absurdly small to the property owner until he stops to figure the large tonnage of some of these minerals that can be mined from a single acre in a year, and until he realizes that it means an income to him with absolutely no risk or effort on his part.

Average Royalties Paid to Property Owners on Minerals Commonly Mined in Georgia*

Mineral	Common Method of Buying Deposit	Usual Royalty When Leased
Alumina	Leased on royalty	50c to \$1.00 per ton
Bauxite	" " "	25c to \$1.00 per ton
Brick clay	Bolt in fee-simple	25c to \$1.00 per ton
Feldspar	Leased on royalty	25c to \$1.00 per ton
Fullers earth	Bolt in fee-simple	25c to \$1.00 per ton
Gold	Leased on royalty	1.00 to 1.50 per ounce
Granite	Bolt in fee-simple	10c to 1.00 per ton
Iron Ore	Leased on royalty	10c to 1.00 per ton
Limestone	Bolt in fee-simple	10c to 1.00 per ton

Manufacture of cement on royalty 20c to 1.00 per ton
Manufacture of lime on royalty 20c to 1.00 per ton
Manufacture of brick on royalty 20c to 1.00 per ton
Manufacture of glass on royalty 20c to 1.00 per ton
Manufacture of pottery on royalty 20c to 1.00 per ton
Manufacture of paper on royalty 20c to 1.00 per ton
Manufacture of soap on royalty 20c to 1.00 per ton
Manufacture of sugar on royalty 20c to 1.00 per ton
Manufacture of tobacco on royalty 20c to 1.00 per ton
Manufacture of wine on royalty 20c to 1.00 per ton

Machite Bolt in fee-simple 50c to \$1.00 per ton
Mica Leased on royalty 1.00 to 1.50 per ounce
Ocher Bolt in fee-simple 50c to \$1.00 per ton
Sandal wood Bolt in fee-simple 25c to \$1.00 per ton
Gravel Bolt in fee-simple 25c to \$1.00 per ton
Lime Bolt in fee-simple 25c to \$1.00 per ton
Ground 25c to 75c per ton

Tripoli Leased on royalty 50c to \$1.00 per ton

*The writer is indebted to Dr. F. M. Mendenhall, Consulting Geologist, Atlanta, Ga., for many of these figures and to various producers for others.

The lease of the mining rights should be carefully drawn up by a trustworthy lawyer. The owner should see to it that the lease contains the following clauses, clearly stated:

1. Cash payment. The amount of the cash payment at the time the lease is signed will depend upon the size of the property and the value of the mineral.

2. Royalty. In addition to stating the amount and method of payment of the royalty, some provision should be made whereby the owner can check up on the tonnage mined on which royalty should be paid. Often this can be done from the railroad records of freight shipped by the company. With valuable minerals, such as gold and sheet mica, provision is sometimes made that none of the mineral may be removed from the property except in the presence of a representative of the owner.

3. Minimum royalty. Provision should be made for the payment of a minimum monthly or yearly royalty whether or not a corresponding amount of the mineral has been mined. It should state that failure to pay this minimum royalty will automatically void the lease. The amount should be large enough to discourage a company from leasing but not mining a property simply to keep it out of the hands of competitors, but should not be so large as to force a financially sound company to abandon the property in times of depression when production is naturally low.

4. The owner should have the right to farm or remove timber from land not in necessary use by the company.

5. The company should be liable to all damages to crops, stock, houses or equipment caused by the mining operations.

The owner should avoid selling the mineral rights on his place for a fixed sum to any individual or company which has no intention of mining but is buying it for an investment. The owner seldom gets a fair return for his mineral rights in such a sale, and the buyer often prevents development by expecting too large a return on his investment. A better arrangement would be for the owner to pay the "premium" a commission out of the regular cash payment if he can arrange for a mining company to lease the mining rights in the usual way.

The owner of a mineral deposit should make sure that he has a clear title to the mineral on his land. In selling land, es-

pecially in north Georgia, mineral rights are often "reserved". All future deeds to the land should state that the mineral rights have been reserved, but often this has been neglected and is the cause of many law suits. Mineral rights, when owned separately from the land, are personal property and are subject to taxation, according to Section 1008 of the Georgia Code. This fact is little known, even to many of the county tax authorities. The title to mineral rights held separately from the land is, therefore, not clear unless they are annually returned for taxation and the tax paid.

Owners of mineral deposits should avoid forming an exaggerated idea of the value of their deposits which will result in the purchase of other properties rather than theirs. A carefully drawn lease of the mineral rights, with a reasonable royalty, to an honest and financially sound company will often result in a steady income for years to come. The mineral has no value as long as it remains in the ground, but only becomes valuable as it is put to use.

Bauxite Destroys Harmful Exhaust of Motor Cars

Bauxite, an ore from which aluminum ware is made, appears in commercial deposits in middle and northwest Georgia.

A new use discovered by Dr. John Yeager of Great Britain. Bauxite can be employed to destroy deadly fumes from motor car exhausts by the use of the ore in an exhaust box. The exhaust of carbon monoxide gas, unburned gasoline and oil, are consumed or rendered harmless by contact with bauxite, with no back pressure nor loss of efficiency of engine power.

TIMBER OWNER TURPENTINE OPERATIONS ADVOCATED

An article by Lenthall Wyman of the Southern Forest Experiment Station, in the Journal of Forestry, advocates management of turpentine operations by the land owner. Timber stands are "often ruined by careless turpentineing", he says, but he adds, "with a few precautions timber may be worked in such a way that there will be very little injury to the trees," and "later be utilized for timber, ties, pulpwood, poles and piling."

Quoting further: "If a piece of timber is small it will be to the farmer's advantage to work it himself or have it done under his own direction. Arrangements can usually be made to sell the gum direct to the nearest still. In this way he can watch his timber closely and in case of dry weather or other adverse conditions he can lighten up in his work and forestall possible damage. He can adjust his work to the market—speeding up when prices are high, reducing chipping frequency when prices are off. This cannot be readily done if the timber is leased out. The farmer who has turpentineing work going on is enabled thereby to

keep close watch over his woods through his workmen. He can reduce trespass to a minimum and be on the ground to keep out fire."

The objectives advocated by Mr. Wyman are probably a long way off. Before progress in the direction of land owner cupping can be made, right methods of chipping must be taught them. In view of the slow progress made in inducing the comparatively few turpentine operators to adopt better methods, how much larger task it will be to teach the multitude of land owners.

GEORGIA GEODETIC AND TOPOGRAPHIC MAPPING

The United States Coast and Geodetic Survey has more than 100 men at work and soon expects to have as many as 400 employed in Georgia making triangulation and secondary traverse surveys. The state is divided up into districts for the purpose of this type of survey, designated as follows: Atlanta, Athens, Augusta, North Georgia, Griffin, Macon, South Georgia, Savannah. The North Georgia and South Georgia districts may be subdivided later.

The general director of the work in Georgia is Frederick H. McDonald, Atlanta. Each district is in charge of an engineer with varying numbers of crews in his charge.

The information developed by this survey is of importance in making topographic surveys, as well as for accurate mapping of all kinds.

Another type of survey now in progress in Georgia is conducted by the United States Geological Survey. This survey centers around Warm Springs and Thomaston and is associated with the complete geological survey now being made of the Warm Springs area.

Four or five crews of surveyors are at work mapping elevations, contours, streams, highways, secondary roads, railroads; in other words, they are making a complete physiographic picture of the area. Later on topographic maps of the area, similar to those already issued for parts of Georgia will be put out.

Funds for these surveys have been made available from federal sources, and as a result a number of unemployed engineers and geologists, as well as helpers, are finding work to do.

The December issue of the Georgia Agriculturist, the student magazine of the State College of Agriculture, was devoted to forestry, with many interesting articles on forestry in Georgia.

Less acres to crops, more acres to trees.

Take the teeth out of erosion by planting trees.

Make a firebreak for the tree's sake.

EDUCATIONAL SUPERVISORS TO SERVE CCC CAMPS

Arrangements have been made to have an educational supervisor at each CCC camp, for the purpose of giving the men an opportunity to pursue their education and to receive vocational guidance that will better fit them for their life's work. The educational supervisor will be assisted by men of the camp who are qualified and willing to teach.

The teachers are selected by the Chancellor Emeritus of the University of Georgia, Dr. C. M. Snelling, Athens; Paul Chapman, Supervisor of Vocational Education in Georgia, Athens; and Harry Brown, Acting Director of Agricultural Extension of Georgia, Athens.

It is to the credit of Georgia that it inaugurated educational work at many of the camps at the outset, and particular credit is due the foresters, ex-vocational teachers and others in the camps who, on their own initiative, started classes and carried on educational work.

The recognition of the educational opportunities offered at the camps, by federal agencies, and the allotment of funds with which to organize and systematize the work, of course, make it possible to develop instruction on a larger and more helpful scale.

C. C. C. men should welcome the opportunity thus afforded for overcoming to some degree the handicap they have been made to suffer for lack of a chance to continue their education because of poverty.

Lumber Code Fosters Sustained Production

Speaking of the Lumber Code's provisions for sustained production of forest resources, the Southern Lumberman says editorially: "It is hard to over-emphasize the tremendous importance of this development. It means an end to the old 'cut out and get out' operation.

"Just how long it will take to work out all the details of the new plan and get it into operation remains to be seen; but it may at least be safely said that there has been more progress made in the last sixty days than there has been in the last sixty years. A permanent lumber industry is now more than a dream, it is in a fair way to becoming a reality."

GRAY FOX APPEARS TO BE FOREST FRIEND

In the 12th Annual Report of the Appalachian Forest Experiment Station, biologist Thomas D. Burleigh says:

"While too definite statements are not as yet justified, it appears now that the gray fox does not deserve its reputation for destructiveness and that its value in holding rodents in check more than offsets the little harm it does to game birds."

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

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No. 2

WORK ACCOMPLISHED BY CCC MEN IN GEORGIA

Forest Fire Protection Measures Chief Objective In State Super- vised Camps—State Property Im- provements

The Georgia Forest Service now has 28 CCC camps under its supervision. Most of the work of these camps is on fire protection measures for lands of timber owners belonging to timber protective organizations. Other work is on state owned lands.

Because most of the timber protective organizations in existence at the time E. W. work was authorized were located in South Georgia, and since authority was given to do work on no private lands except those controlled by these organizations, it follows that the southern part of the state obtained the greater proportion of the camps.

Only fire protective work is permitted with CCC men on private lands, such work being the construction of primary firebreaks, truck trails, fire towers and telephone lines. The firebreaks are 25 to 30 feet wide and follow as nearly as possible straight through the organized forests. These breaks are cleared of all trees and stumps and then plowed. Some of them are converted into truck trails to facilitate the movement of fire fighting equipment in the forest. This means the construction of bridges on the firebreaks.

To add to the efficiency of the firebreak, all dead snags for several feet on either side that might be sources of embers which the wind could carry across the break, are removed.

The CCC men are permitted to construct fire towers of wood or steel, these being used as lookouts for detecting the appearance of fires over wide areas. Telephone lines radiating from these towers to residences of fire fighting crews are constructed as a part of the fire protection project.

The CCC men are also used for fire suppression in a given radius of the camps. A report of their activities will appear in a later issue.

Summary of Work Done

A summary of work done by the 28 CCC camps up to January 1 throughout the state is as follows:

DANIEL M. BYRD COMMISSION MEMBER

Daniel M. Byrd, Atlanta, Georgia, was appointed in January to membership in the Commission of the Department of Forestry and Geological Development to fill the position made vacant by the death of Robert E. Price, of Kingsland.

The appointment was made by Governor Eugene Talmadge after carefully considering the situation and in conformity with the law which required that the vacancy be filled by appointment of a citizen of North Georgia.

Mr. Byrd is a well known attorney and official of the Atlanta Retail Credit Company, being closely associated with T. G. Woolford, President of the Georgia Forestry Association.

Before the reorganization of the state's offices in 1929, Mr. Byrd was a member of the Game and Fish Commission. His interest in the natural resources of the state, long manifested in a constructive manner, is now centering in forestry and geology, and all who know him realize that his new obligations will be ably met.



Dan M. Byrd, New Member Commission Forestry and Geological Development

HOW FOREST FIRES HARM FISH LIFE

In burning Forest Organic Matter Fires Destroy Food for Minute Life of Water which in Turn is a Source of Food for Higher Life on Which Fish Feed

Unburned forests are constantly draining into streams bits of organic matter containing carbonates and nitrates. These elements are necessary food for a vast number of very small microscopic life inhabiting the water, so numerous that their total weight in a body of water is seven to eight times that of all larger, visible animal life.

These minute forms in the streams are sources of food for a higher order of life easily visible to the eye. Then in turn these small animals are fed upon by a group of larger size, and these in turn the fish feed upon. Thus it will be seen that the organic matter coming from the woods to the streams starts a train of life process that feeds fish and man.

It has often been observed that clearing up forest lands has reduced the number of fish in the streams. The reason is that the streams no longer get as much decomposed vegetable matter or plankton, as formerly. The same thing is true when the woods are burned off annually. The fire destroys and sends off into the air as gasses the carbon and nitrogen. Otherwise these important food materials would have been conveyed through different stages of animal life to fish as food.

The better class of fish is starved out first. Crayfish, suckers and minnows, which are able to subsist on a lower form of life, consume the available food before it can be converted into the higher forms such as trout or bass feed upon.

In a sense, the unburned forests provide material to enrich the streams and lakes for growing fish food, and the more this material is added, the greater will be the number of fish. The conclusion is, keep fires out of the forests and you will thereby be feeding the fish.

It may be added that keeping fires from the forest also preserves food for quail and other wild life, so that the land owner who wants fish and game on his place should guard against and fight forest fires.

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Extension Foresters

Bonnell Stone, Chairman, Oxford
Dupre Barrett, Athens
K. S. Trowbridge, Tifton

(Continued from Page 1, Col. 1)

Firebreaks constructed, 1,100 miles;
Acres cleared for fire hazards along
firebreaks, 9,550
Roadside strips cleared of fire haz-
ards, 102 miles;
Telephone lines constructed, 64.6
miles;
Number of lookout towers, 4;
Man hours spent on fighting fires, 8-
306;
Miles of new truck trails, 116.5;
Miles of foot and horse trails, 94;
Number of permanent buildings, 18;
Acres of forest land mapped, 724,100;
Number of vehicle bridges, 383.

Work on State Lands

CCC workers are used on a number of state projects where the character of work is broader than on T. P. O. lands. The main activities of this class are at Indian Springs park in Butts county; Alexander H. Stephens Memorial park at Crawfordville in Taliaferro county; Vogel park at Neel Gap in Union county; the Gwinn-Nixon State forest at Augusta in Richmond county; the Hunt Estate of the University of Georgia in Hall county; the State Prison farm near Reidsville in Tattnall county.

On these areas roads, firebreaks, truck, foot and bridle trails, drainage, bridges, houses, plantings and forest improvement are permitted.

Summarized by Camps

SP-1, Indian Springs—Truck trail .3 mile; foot and bridle trails 3.5 miles; permanent buildings 3. A large amount of wall construction, terracing, forest improvement, planting, etc.

52, Homerville—67 miles firebreak; 508 man hours fire fighting; 44,157 acres mapped.

53, Hinesville—6.5 miles telephone line; 75 miles firebreaks; 1 lookout tower; 88 man hours fire fighting; 29 miles truck trail; 98,000 acres mapped; 37 vehicle bridges.

54, Albany—9.3 miles telephone line; 56.8 miles firebreak; 35 acres long firebreak and 7 miles along public roads cleared of fire hazards; 1,424 man hours fire fighting; 1 building erected on state tree nursery.

55, Blairsville—10 miles telephone line; 1 mile firebreak; 90 acres along firebreak and 7 miles along roadside cleared of fire hazards; 266 man hours fire fighting; 9 miles of truck trail; 9.7 miles foot and bridle trails; 7 permanent buildings; 25 acres mapped; 47 vehicle bridges.

56, Warm Springs—22 miles of firebreaks; 1 mile roadside clearing; 332 man hours fire fighting; 5.5 miles truck trail.

57, Sylvania (new camp)—4 mile firebreak; 219 man hours fire fighting; 6 vehicle bridges.



Robert Fechner (right) and Col. Thomas S. Moorman at Indian Springs

58, Ellijay—8 miles telephone line; 10 acres along firebreaks and 7 miles along roads cleared of fire hazards; 63 man hours fire fighting; 15 miles truck trail; 18 miles foot and bridle trail; 68 bridges.

59, Fargo—42.2 miles firebreaks; 492 man hours fire fighting; 15,000 acres mapped.

60, Woodbine—31.4 miles firebreak; 39 man hours fire fighting; 10,500 acres mapped.

61, Soperton—5 miles telephone line; 119 miles firebreak; 3,330 acres of fire

hazards removed from firebreaks; 2 lookout towers; 50 man hours fire fighting; 4 miles truck trail; 154,000 acres mapped; 4 vehicle bridges.

62, Baxley—58.9 miles firebreaks; 120 man hours fire fighting; 22,000 acres mapped.

63, McRae—45.4 miles firebreaks; 1 mile roadside clearing; 43.5 man hours fire fighting; .3 mile truck trail; 20,000 acres mapped.

64, Crawfordville—30 acres along firebreaks cleared of fire hazards; 12 man hours fire fighting; 1 permanent building; 2 vehicle bridges; grading, terracing, planting.

65, Jesup—42 miles firebreak; 84 man hours fire fighting; 6,300 acres mapped.

67, Bainbridge—103.2 miles of firebreak; 643.5 man hours fire fighting; 2.2 miles truck trail; 56,000 acres mapped.

69, Commerce—610 fire hazard reductions; 21.4 miles roadside clearing; 15 man hours fire fighting; 20.5 miles truck trails; 7.3 miles foot and bridle trails; 1 permanent building; 7,000 acres mapped; 26 vehicle bridges.

71, St. George—10 miles telephone lines constructed; 64.3 miles firebreaks; 212 man hours fighting; 2 miles truck trail; 30,000 acres mapped; 12 vehicle bridges.

72, Waycross—17.5 miles telephone line; 92.5 miles firebreak; 253 man hours fire fighting; 38,486 acres mapped.

73, Hiawassee—11.3 miles telephone line; 1.5 miles firebreak; 130 man hours fire fighting; 9.2 miles truck trail; 14.5 miles foot and bridle trail; 6 permanent buildings; 46 bridges.

74, Toccoa Falls—4 miles of firebreaks; 11.3 miles roadside fire hazard cleared; 1 lookout tower; 207 man hours fire fighting; 37.4 miles truck trail; 3.5 miles foot and bridle trail; 7,650 acres mapped; 52 vehicle bridges.

75, Fort Gaines—44.5 miles firebreak; 5 miles roadside clearing; 828 man hours fire fighting; 7 miles truck trail; 56,064 acres mapped; 25 vehicle bridges.

77, Tate—10 miles firebreak and 1 mile roadside fire hazard removed; 667.8 man hours fire fighting; 5 miles foot and bridle trails; 25 vehicle bridges.

78, Butler—52 miles firebreaks; 448 man hours fire fighting.

79, Cornelia—2,525 acres of fire hazard removed along firebreaks and 15.7 miles along roadsides; 57 man hours fire fighting; 16 miles new truck trails; 15.5 miles foot and bridle trails; 21 bridges.

81, Bloomingdale (new camp)—1 mile firebreak; 111.6 acres of fire hazard removed along firebreaks; 89 man hours fire fighting; 3.5 miles truck trail; 7,486 acres mapped.

82, Reidsville (new camp)—2 mile firebreak; 1 mile roadside cleared; 5 man hours fire fighting.

FORESTRY OUTLOOK BRIGHT IN SOUTHERN STATES

Authority Rates South First in Advantages of Forestry Development—Forest Industries to Take High Rank in South's Economic Future

E. L. Demmon, Director of the Southern Forest Experiment Station, New Orleans, and leading authority on southern forestry, writing in *Southern Lumberman* on "The Forestry Outlook in the South", presents an optimistic view. Extracts from this article are reproduced herewith:

"As a field for forestry development, the South has outstanding advantages, among which are its great number of valuable and fast-growing native timber species, its long growing season, its abundant rainfall, the comparatively easy logging conditions, the relative ease and low cost at which forest crops can be produced, and its proximity to great timber markets. As to area to forest land, the South leads all other sections of the United States, with approximately 191 million acres, or 39 per cent of all the commercial forest land in the country. When the total of all commercial and non-commercial forest land is taken into account, the South contains practically 217 million acres, or 35 per cent of the total of the United States. Forest land (in many instances no longer forested, but originally in forest and not used primarily for other purposes) makes up over 73 per cent of the land area of the South; commercial forest land represents more than 64 per cent of the South's total land area.

"As the acreage of agricultural crops in the South declined over a million acres between 1920 and 1930, there is no reason to believe that any considerable area of forest land will be needed for agricultural development in the near future.

"The forest lands in the South are largely in private ownership. Less than 2 per cent of the forests are in federal ownership. "Of the commercial forest land in the South in private ownership, over two-thirds are in the hands of industrial owners, and the balance, about 30 per cent of the total, is in woodlands on farms. These combined private holdings represent almost half of all the privately-owned forest land in the United States.

"From the standpoint of current growth, the South exceeds all the remaining forests of the nation. In total volume of saw-timber and cordwood combined, the United States Forest Service estimates show the South's forests to be producing at the current growth rate of about 4.8 billion cubic feet annually, or 54 per cent of that for the United States as a whole. In saw-timber growth alone, the forests of the South are growing currently 6.8 billion board feet each year, or 58 per cent of the total for the United States.

"Although exports of forest products

have fallen off greatly since 1929, the proportion coming from the South has increased for both softwoods and hardwoods, in quantity as well as in value. It is of interest to note that for the South the value of exports in proportion to their volume far exceeds the ratio for the United States as a whole.

"Further evidence of the importance of the South's forests is the stands of the principal kinds of wood used in the manufacture of pulp and paper in 1931. At that time the South had 42 per cent of the volume of all pulpwood species in the United States. The importance of this factor of volume, however, is magnified by the growth potentialities of the South, which as indicated previously, far outweigh those of any other region.

"There is good reason to believe that the South with its outstanding advantages for forestry developments, will continue to be an outstanding region from the standpoint of the production of timber and other forest crops and that the forest industry will take high rank in the South's economic future as it has in the past. Southern land owners are fortunate in having these opportunities and should be prepared to take full advantage of them."

ENORMOUS EROSION TOLL REFORESTATION AN AID

More plan: food is allowed to wash away from the soil of the United States each year than is removed by the growing crops. In the south the losses from abandoned farm lands through unrestrained erosion and surface gullying are highly destructive not only to the sloping lands, but to the bottom lands upon which the washing rains deposit sand, gravel and raw soil from the upland gullies.

The only hope for recovering these washed lands for profitable use is to plant them to trees which will not only bind the soil and hold it in place, but produce an income while restoring the land to future agricultural use.

The U. S. Department of Agriculture says:

"On the basis of experiments at the 10 regional stations, specialists of the Department estimate that not less than one and one-half billion tons of soil are washed out of the fields of the United States every year. Results thus far indicate that in normal times the direct cost of this enormous loss of soil amounts to not less than \$4,000,000,000 annually. The farmers pay this bill."

The Year Book of the United States Department of Agriculture says:

"Erosion has practically destroyed for American agriculture more than 20,000,000 acres of land formerly in cultivation. All crops grown in the United States annually remove about six billion pounds of plant food from the soil. Erosion annually removes about 21 times as much."

RESIN IN SLASH AND LOBLOLLY PINE VARIES

Seasonal Differences in Resin Content of Wood Discovered by Bishop and Marckworth of Georgia School of Forestry

It is considered desirable to harvest pine pulp wood when it contains the least resin. To determine whether there are seasonal variations, G. N. Bishop and G. D. Marckworth of the Georgia School of Forestry took borings of slash and loblolly pines monthly October 1931 to August 1932 and analyzed the chips from these borings for resin content. The results are reported in the December issue of the *Journal of Forestry*.

Borings were made at the base, midway in the trunk and in the crown of a number of slash and loblolly pines.

Considerable seasonal variations in the resin content of the wood were discovered. This was found to be associated with the temperature. When the temperature drops below 40 degrees Fahrenheit, the resin content of the wood is markedly less. For instance, in March, which was the coldest month in 1932, the resin in the loblolly pine wood was 2 per cent in the base, 1.15 per cent in the middle and 1.8 per cent in the crown, whereas in February, with higher temperature, the percentages of resin were 3.9 for the base, 3.3 for the middle and 3.7 for the crown.

The conclusion is that the best time to secure wood of low resin content is immediately after a cold snap when the temperature has fallen below 40 degrees.

Another interesting finding is that the average resin content of the sapwood of second growth loblolly and slash pine is least in the base of the trunk, and increases going up the tree.

Investigations thus far indicate that the decrease in resin content is associated with an increase in moisture content and vice versa.

The seasonal variation in resin content of slash and loblolly wood is practically the same, being around 3 per cent.

Studies are in progress on longleaf, the results of which will be reported when completed.

Mayor Bonnell Stone

At a January election of city officers of Oxford, Georgia, Bonnell Stone, the "Father of Forestry in Georgia", was chosen mayor. He represents the third generation of the Stone family to serve the educational town of Oxford in an official capacity.

Though reared in Oxford, Mr. Stone as a forester lived in Blairsville and had been in Oxford only about a year when his helpful interest in civic affairs won the position of mayor.

FORESTRY QUESTION BOX

Will the Slash Pine Grow in North Georgia?

While the slash pine is native of the lower part of Georgia, plantings of slash in the northern part of the state are making good growth. One of the severest tests of the slash pine outside of its habitat, is at Mount Berry at Rome, where it is doing well on the top of a mountain nearly two thousand feet high.

Would the Market for the Gum of Red Gum Trees now Justify Chipping These Trees?

The price has been very low in the last two years, and foreign competition has been very severe. While some profit can now be obtained, unless some regulation of imports are made, domestic gum is not likely to be as profitable as formerly.

Why Not Plant Black Locust Seed Where You Want the Trees to Grow?

Birds, rats, mice and other animals eat the seed and a poor stand is likely to result. It is better, for this reason, to plant one-year old seedlings.

Should One Cut Back the Tap Roots of Seedlings when Planting?

No, unless the root is broken or badly damaged. The planting hole should be deep enough to accommodate the tap root without cramping it. Pines especially must develop their tap roots first and should be given every opportunity to grow straight down into the ground without loss of time.

Alabama Forestry Division reports the largest holly tree in that state on the highway between Andalusia and Brewton. It is 60 feet high and 32 inches in diameter. Has Georgia as large, or larger holly tree?

COLLECTING LOCUST SEED

C. F. Olsen of the Southern Forest Experiment Station, made observations on collecting pods and threshing seed of black locusts in Mississippi. He found that an experienced laborer collected 21.44 pounds in an eight hour day. An average of 3.62 pounds of pods yield a pound of clean seed. His conclusion was that an inexperienced laborer could be expected to collect 6 pounds of seed per day.

Pods should be thoroughly sundried before they are flailed to remove the seed. Electric fans are used to clean the seed. The average cost of harvesting, threshing and cleaning at CWA rate of wages was 31 cents per pound.

LONGLEAF FIRE DAMAGE OBSERVED IN SOUTHEAST

Recent studies of fire damage in even-aged second-growth longleaf pine on the Osceola National Forest, Florida, have determined the extent of the close relationship between size of the trees and the killing effects of fire. One study was made of a severe fire that occurred during the dry period in the spring of 1932 following three years of protection. For every inch increase in diameter in trees between 1 inch and 8 inches d. b. h. an average increase of 16 per cent in the number of trees killed was found. For the trees in the 2 inch diameter class, mortality was 100 per cent; for the 4 inch trees, 54 per cent; for the 6 inch trees, 22 per cent; and for the 8 inch trees, no per cent.

In uneven-aged stands in the southeast, studies indicated that longleaf trees over 2 inches in diameter are not generally killed except by fires severe enough to kill at least 20 per cent of the stand; and that trees over 4 inches in diameter breast high are not killed except by fires severe enough to kill at least 40 per cent of the stand. In fires of greater severity, mortality occurs in all diameter classes.—Southern Forestry Experiment Station.

GEORGIA, NEW HAMPSHIRE WHITE PINE GROWTH RATES

Comparing growth rate of white pine on Cooper creek in Union county, Georgia, with white pine growth on the Yale forest at Keene, New Hampshire, J. T. Kimberly presents in the December, 1933, issue of the Journal of Forestry his results, which confirm findings of J. A. Cope (Journal of Forestry, Vol. 30, pages 821-828).

In Kimberly's investigations 345 trees at Cooper creek and 345 at Keene were studied for age, diameter breast high and total height.

The average diameter of the Cooper creek tract was 15.3 inches; at Keene 11.9 inches.

The average height of trees at Cooper creek was 78 feet; at Keene 55 feet.

Comparisons were based on trees of equal ages on the two sites and all were second growth. The investigator reports that white pine on Cooper's creek were on the best sites, whereas at Keene it occurs on medium to poor sites.

Leaders in Lumbering

Yellow pine lumber is greatest in demand, and Alabama the leading producer. Tennessee leads in hardwood; South Carolina is first in red gum. Idaho takes first place in white pine production. Washington produces more baths and shingles than any other state.

Among the items of CCC camp equipment are 16,285 fire extinguishers for camp protection.

REFORESTATION TO MAKE NORRIS DAM EFFECTIVE

CCC camps are employed on the watershed above the proposed Norris Dam of the Tennessee Valley project, to prevent erosion which, if left unchecked, it is estimated will reduce the water storage capacity of Norris dam 25 per cent in 25 years.

C. M. Edwards, chief forester of the Tennessee Valley Authority, who made the above estimate, says there are 1,856,000 acres in the drainage basin above Norris dam, 60 percent of which is in forest. Of the remaining 742,000 acres, which now or sometime in the past have been cleared for cultivation, 60 per cent, to quote Mr. Edwards, "are absolutely destroyed for farming" by erosion.

Reforestation of 297,000 acres of abandoned farm land as a primary means of erosion control, perhaps also the reforestation of acres of submarginal land now being cultivated, and the terracing of farm lands that are to remain in cultivation, constitute the problem of making Norris Dam fully effective.

Bruno Huber, a German, has devised a method of measuring the movement of sap and has found that its rate is as high as 36 feet per hour for broadleaf trees and with vines up to 150 feet per hour.

A cargo of 4,000,000 feet of lumber recently reached this country from Russia. A tax of \$4.00 per thousand board feet was charged at Providence, Rhode Island.

ADVOCATES TREE PLANTING IN COTTON LAND USE PLAN

J. Phil Campbell, for many years director of agricultural extension in Georgia, but temporarily assigned for duty with the AAA program to promote replacement crops where land is taken from cotton and tobacco, advocates planting trees as one of the measures, in the January issue of the Progressive Farmer. He says:

"Thousands of farms in the cotton belt do not yield sufficient wood and timber for their own use. No better use could be made of some of the land retired from cotton than to plant it to trees for farm woodlots and for timber production to sell. In many sections natural reforestation will automatically take place on retired cotton land in a few years, if forest fires are held in check."

Announcement has been made of the sixth annual Appalachian Trail Conference to be held June 30 and July 1 at Long Trail Lodge, Rutland, Vermont.

Among the visitors at the offices of the Georgia Forest Service was Samuel R. Broadbent, supervisor of the Cherokee National Forest at Athens, Tennessee, and Mr. Hemingway, also of the National Forest Service.

WORK WITH TURPENTINE DISTILLERS IN SOUTH GEORGIA

K. S. Trowbridge, extension forester, who has as his major project the installation of the modern government turpentine stills, reports 20 jobs of government still setting to be attended to, with two recently completed.

Mr. Trowbridge has a number of requests from county agricultural agents for service, but in view of the campaign for cotton and tobacco acreage reduction in progress, they are asking that forestry extension work be postponed until after the campaign is over.

The requests for forest service in south Georgia is giving Mr. Trowbridge all he can do, and considerable concern as to how he is to find time to do it. His headquarters are at Tifton.

W. H. Savage, field representative of the American Tree Association, Washington, D. C., was a recent caller at the offices of the Georgia Forest Service in quest of information on the progress of CCC work and forestry in general in Georgia.

The Japanese walnut (*Juglans sieboldiana*) is credited with being the most rapid growing walnut in the world. At Monte Alto, Pennsylvania a Japanese walnut seven years old is reported to have grown in one year, 1932, 7.85 feet in height.

Robert Fechner Visits Georgia

Robert Fechner, head of ECW work in Washington, was a visitor at the office of the Georgia Forest Service on January 8. Mr. Fechner is a resident of Savannah, and while on a holiday visit took occasion to inspect CCC camps in a part of Georgia. He expressed himself as well pleased with the progress of work.

Eitel Bauer Joins South Carolina Foresters

Eitel Bauer, formerly in charge of the State tree nursery at Albany, more recently a CCC camp superintendent at the same place, resigned effective January 20 to accept the position of district forester at Spartanburg in South Carolina. Mr. Bauer is a graduate of the School of Forestry of the University of Georgia, and obtained a master's degree from Harvard University. His service with the Georgia Forest Service has been of high order.

He is a native of Columbia, South Carolina.

The Southern Cypress Manufacturer's Association, Jacksonville, Florida, has been designated code authority for all manufacturers of red cypress lumber and cypress timber products. Those who contemplate sawing or marketing cypress products should receive authority from this association.

ICE DAMAGE TO TREES OF SOUTHERN APPALACHIANS

Chas. A. Abell of the Appalachian Experiment Station, Asheville, reports in the January 1934 Journal of Forestry, the damage of glazed ice on southern Appalachian forests in December 1932 at Highland, N. C.

Entire mountain sides were specked with bright spots where branches and tops had been torn away. Larger trees suffered mainly from loss of branches and breakage of main stems within the crown. Pole size trees in many instances were broken off below the crowns. Saplings were badly bent. Pole size stands with even canopies were apparently damaged more than stands with irregular canopies.

White pine and hemlock suffered the least damage. Scarlet oak and black locust were damaged most. Red maple was among those suffering heavily, while white and black oak were intermediate.

NATIONAL FOREST PROCEEDS TO GEORGIA COUNTIES

The counties of North Georgia having national forests are to receive 25 per cent of the proceeds of timber sales in 1933. This amounts to \$637.58, according to the U. S. Department of Agriculture.

An additional 10 per cent, or \$255.03 goes to roads and trails on the national forest area in Georgia.

California Flood Flow Burned and Unburned Land

Twelve inches rainfall resulting in disastrous floods in southern California recently afforded an extreme test of the value of unburned forest areas in flood control.

For several years the Forest Service has conducted water run-off experiments in San Dimas canyon. E. I. Kotok, director in charge, says:

"Roughly, more than thirty times as much water came off a burned area as came off an unburned area, which means that if the protective brush cover had been left intact, less than one-thirtieth of the run off would have occurred."

Prussia owns 6,167,050 acres of forest land which it has acquired at an average cost of \$75 an acre. In 1928, Prussia obtained an income of \$21,500,000, but in 1931, for the first time in history, there was a net loss of \$3,648,000.

Those who desire to vote for a national tree can send votes to the National Life Conservation Society, 2239 Trebout Avenue, New York City. More than 100,000 votes have been cast and the American elm leads by a wide margin.

NORTH GEORGIA MINERAL RESOURCES INVESTIGATED

The Tennessee Valley Authority is using three technically-trained men to study the mineral resources of Georgia under the supervision of State Geologist Richard W. Smith. These men are graduates of the Georgia School of Technology and are W. C. Hansard, J. S. Lewis and A. E. Johnson.

Work began at Cartersville on January 2 and will be carried on in other North Georgia counties. The information collected will be made available at the general office of the Tennessee Valley Authority at Knoxville, Tenn., and at the office of the State Geologist of Georgia at Atlanta.

State Geologist Smith advises owners of properties having mineral deposits in the region to avail themselves of the opportunity of having them examined and listed for prospective buyers, without cost.

Expenses of the men are paid from CWA funds, but their transportation to private property will have to be assumed by the property owners.

Oldest Tree and Highest Fir

It is claimed that the oldest tree in the world is a cypress tree standing in an Indian village at Santa Maria Del Tule near the city of Oaxaca in Mexico. According to Dr. von Schrenk, the tree is at least 4,000 years old, the oldest living thing in existence. It is 140 feet high and 117 feet 40 inches around at the surface of the ground.

A recent item from Portland, Oregon, claims that the tallest fir tree believed to be in existence is near Ryerwood, Washington. The tree stands 324 feet and 4 inches in height, is 37 feet 1 inch in circumference and approximately 12 feet in diameter. Another fir near by is 311 feet high.

Lumber production in 1933 for the United States totaled about 13 billion feet, being a gain of 30 per cent over 1932.

One ton of pine waste will yield from 15 to 25 gallons of 190-proof alcohol.

W. L. Moore, who has been inspector of CCC camp work in Georgia, was recently assigned to the CCC camp at Albany as superintendent, succeeding Eitel Bauer, resigned.

Toll of Forest Fires

Charles Lathrop Pack, president of the American Tree Association, says:

"On the average, 50,000,000 acres of national, state and privately owned land are swept by forest fire each year. This loss alone averages \$200,000,000 a day. We use in this country fourteen and one-half billion feet of wood a year, and yet fire, disease and insects destroy one and one-fourth billion feet every year."

FIRST DISTRICT

**W. D. Young, District Forester
Rome**

**Lookout Mountain Park Site
Offered State**

Several land owners on Lookout Mountain, near Cloudland, Georgia, are offering to the state 220 acres, or more, for a state park. This area includes part of the headwaters of Little river located on the mountain, and when improvements are completed, it will be a very unique park, having a lake and other facilities for visitors.

Notes on Camps

Work projects at camps in this district are progressing rapidly, and every effort is being made to push to completion the work as authorized during this second six months period of operation. Plans are being made for additional work projects at the present camps to carry through the third work period beginning in April.

SECOND DISTRICT

**E. B. Stone, Jr., Dist. Forester
Gainesville**

**AUTOMOBILE ACCESS NOW
PROVIDED TO GEORGIA'S
HIGHEST PEAK, ENOTAH BALD**

**Unsurpassed Scenery Brought to
View in Hitherto Inaccessible Re-
gion — Center of Great Virgin
Forest Area on the Crest of Blue
Ridge Range of Mountains**

Thanks to ECW funds and CCC boys, a road has been completed to Georgia's highest peak, Enotah Bald in Towns and Union counties, a mountain rising to an elevation of 4,768 feet. Heretofore it has been necessary to hike at least 5 miles over forest trails to reach the summit of this mountain.

The new road which follows the backbone of the ridge north from Jack Gap, makes the mountain accessible both from the Unicoi Gap Highway No. 75 and the Appalachian Scenic Highway State Route No. 11. It is 7 miles from the Unicoi Gap Highway and 13 miles from the Appalachian Scenic Highway. These roads open up a large section of the North Georgia mountains which heretofore has been inaccessible for automobiles and was consequently visited by only a few of the more adventurous hikers.

The view of Enotah Bald is unsurpassed by that from any other mountain in the Southern Appalachians. Situated as it is inside the great loop made by the Blue Ridge, it enables one to get a comprehensive picture of the entire mountain system of northeast Georgia. From its summit most of the prominent peaks of this region are plainly visible, as are the principal gaps in the Blue Ridge. Among the mountains which can be seen are "Standing Indian", in North Carolina, "Rabun Bald",

"Trey Mountain", Level Land Mountain", "Blood", "Slaughter", "Yonah" and "Coosa Bald".

The following gaps are also plainly visible: "Dick's Creek", "Swag of the Blue Ridge", "Indian Grave Gap", "Unicoi Gap", "Tesnatee Gap", "Neel Gap", "Slaughter Gap", "Wolf Pen Gap", and "Mulkey Gap".

Enotah Bald is covered with a mass of native ornamental shrubs, most abundant of which are purple rhododendron and a large variety and number of species of azalea. This mountain stands in the middle of the largest remaining virgin hardwood forest to be found anywhere in the United States.

Ample parking space and other facilities are to be provided for those wishing to visit the mountain.

THIRD DISTRICT

**C. N. Elliott, District Forester
Augusta**

Woodville T. P. O.

Robert I Calloway has been selected as forest patrolman for 1934 on the Woodville T. P. O. This organization embraces approximately 35,000 acres and lies around the town of Woodville, Georgia. The operating expense will be estimated at two cents per acre. The primary work of constructing 25-foot firebreaks, the building of a lookout tower, and the erection of a telephone system with seven poles is being handled from Camp P-64, located at Crawfordville. Secondary fire breaks will be made by the land owners themselves under the direction of Mr. Calloway.

Nixon State Forest

A side camp of 25 men has been approved for Nixon State Forest. This side camp will originate from Camp P-57, located at Sylvania. It will be located on the Nixon Forest until the completion of the work already begun there during the first six months in which P-57 was located at Waynesboro. The period of time in which this camp will be located on the Nixon Forest is estimated at 45 days. 25,000 Cypress seedlings and 10,000 longleaf pine seedlings will be planted and approximately two pounds of black locust seed will be sowed broadcast.

Captain F. F. Kienast, in military charge of the CCC camp at Toccoa, died suddenly of a heart attack on December 29. He was a captain of the marines and during his long army service had campaigned in many parts of the world, particularly in the Philippines and Nicaragua. He was an interesting character, in every sense a soldier, and added much interest to the camp by relating his army experiences.

He was a native of California and served 30 years in the army. Burial took place at Arlington National Cemetery in Virginia.

FOURTH DISTRICT

**W. G. Wallace, District Forester
Columbus**

**PINE MOUNTAIN FIREBREAK
AND SCENIC HIGHWAY
OPEN TO PUBLIC**

President Roosevelt, on his last visit to Warm Springs, finally managed one day to escape the eyes of the public and drive his car over the Pine Mountain Firebreak and Scenic Highway in Meriwether and Harris counties. We feel that Mr. Roosevelt certainly enjoyed the time taken in the woods where he could for a while banish from his mind thoughts relative to the welfare of the nation. We imagine he almost enjoyed it as much as a little boy playing hooky from school to go fishing.

Although this road along the ridge of the mountain is yet unfinished it is daily traveled by many people interested in the beautiful scenery it affords. When put in good condition by the county road crews we look for this scenery to be very popular.

Precautions are being taken to preserve and develop the scenic beauty of this drive. Roadside placards and signs will be considered particularly objectional. Wild flowers are abundant, especially wild woods violets. In early spring the violets have almost the appearance of a beautiful carpet so thick do they grow in places. The entire area is protected from forest fires by the Pine Mountain Timber Protective Organization which is expected to result in increasingly beautiful mountain scenery as well as more valuable timber and wild life.

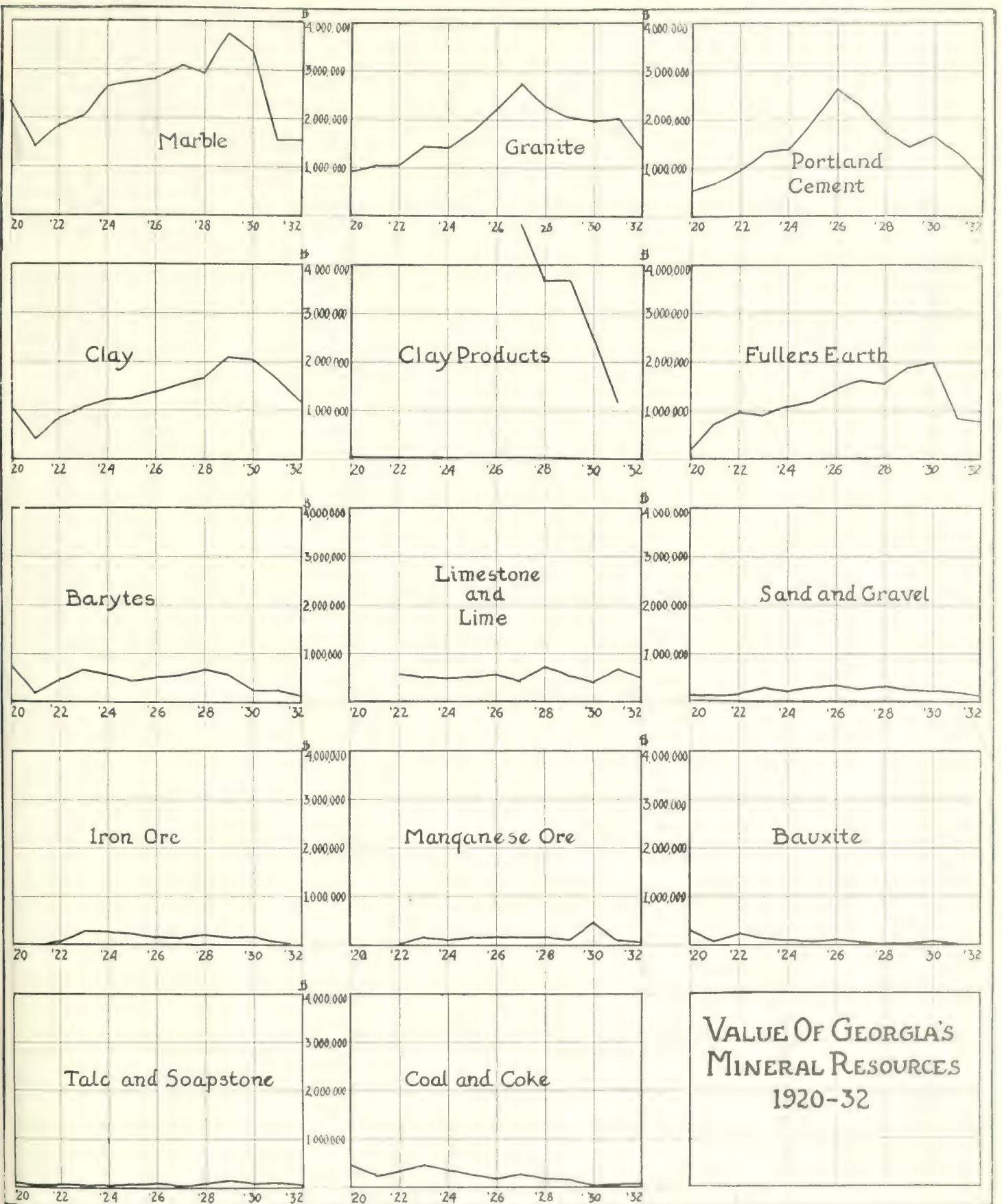
"TRIPLE C" ACTIVITIES

Camp P-56 Warm Springs, boasts a visit from both President Roosevelt and E. C. W. Director Robert Fechner.

Mr. H. N. Wheeler of the U. S. Forest Service recently gave a lecture at the Warm Springs camp with illustrated lantern slides that was received most enthusiastically by the entire camp and the few outsiders present. Quarantine of the boys due to measles prevented the lecture being given in the Warm Springs school auditorium with the public invited.

The camp P-56 "Triple C" boys are planting 22,500 longleaf and loblolly pines for the city of Manchester, Georgia. This planting is being made on idle lands which are a part of the watershed for the Manchester municipal water supply. The boys are very interested in this project as it seems more like forestry to them than grubbing up blackjack oaks and moving dirt.

Since getting a good tractor Camp P-78,
(Continued on Page 8, Col. 1)



VALUE OF GEORGIA'S
MINERAL RESOURCES
1920-32

(Continued from Page 6, Col. 3)

Butler, has completed a goodly number of miles of firebreaks that look mighty good.

The Butler camp boasts a fine basketball team. It seems they have victories over some of the best Ft. Benning teams as well as over the highly reputed Vienna High School team and others. The only thing that can hold down this camp it seems, regardless of whether it's work or play, is measles quarantine. The Butler camp boys think heaven is a place, evidently, where you can't be quarantined and where measles is unknown.

Supt. Barrett has lost the services of foreman W. R. Holden who accepted a job with the Tennessee Valley Authority. The whole camp, as well as the Georgia Forces Service extends Mr. Holden their best wishes.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Telephone Line Construction

The construction of telephone lines on land covered by the Treutlen and Liberty-Long T. P. O.'s is progressing rapidly, and the whole system which is to be used for fire protection work will be completed by February 15.

The poles for the lines were donated by the members of the above T. P. O.'s. They are cypress, with at least 4 inches of heart at the top and about 30 feet long. The poles are placed 150 feet apart in holes 4 feet deep. A line so constructed should last around twenty years without any maintenance cost, barring accidental damage from storms.

Some twenty-five miles of line of the above type have been finished in district six and when all the lines that were approved are finished, we will tie in the three tower unit in Liberty and Long with the two tower unit in Treutlen county, which will give adequate service to the three T. P. O. areas.

Fire Lookout Towers

The five steel lookout towers, three 100 foot and two 80 foot allotted to this district, are under construction. The two 80 foot towers for Treutlen county have been completed and work on the tool house and fence for each tower is well toward completion.

Two of the 100 foot towers for Liberty-Long T. P. O.'s have been completed with fences around the tower areas and the No. 4 tower on this area should be finished by January 25, if good weather holds.

An area with a radius of 7 miles can normally be visualized from a 100 foot tower and an area with a six mile radius can be covered with an eighty foot tower.

The fences around the tower sites are made of cypress poles and the only cost involved is for nails and labor. Instead of having a gate at the entrance, a cattle guard is used in order to allow cars to enter without having to stop to open the gate. When all of the towers are completed and manned, fires in the flat woods will be much easier to spot.

Tar City T. P. O.

Members of the Tar City T. P. O., which was formerly the Tar City Fire Fighting Organization, are busily engaged in putting in their secondary fire breaks and fighting fire. The primary breaks are being constructed by members of the CCC camp at Reidsville.

Emergency Conservation Work Notes

The supervisory personnel and CCC boys at Camp P-81, Bloomingdale, wish that Lieutenant J. M. Evans, Camp Commander, could have remained for the duration of the camp, but he was ordered back to Fort Benning for army duty.

Telephone foreman W. F. Sanders, Jr., has been transferred from Camp P-63, to assist in telephone line and tower construction.

It was so cold one morning recently at Reidsville that one of the boys who is from New York declared that while he was asleep, the camp had been moved back to the north.

Slash Pine in Oregon

In the Peavy Arboretum at Corvallis, Oregon, slash pine are growing at the rate of two feet a year, far from its native habitat in the deep south.

T. J. Starker of Oregon State College, reporting on slash pine's resistance to cold weather in the Journal of Forestry, tells of 9 degree temperatures and freezing weather for 60 days in the winter of 1932-33 to which the slash pines were subjected. All the *Pinus radiata* and many other trees and shrubs were killed or suffered very heavy losses, but only about one-half of the small plantation of slash pine were killed.

Seed from the slash pine have the appearance of being fertile, and observations are to be made to see if the progeny of locally grown seed show any increase in winter hardiness.

Fibre and wall boards which are widely used in construction work are merely pressed wood fibres. Recent experiments have revealed that wood impregnated with a certain metal composition results in a metalized wood which retains the good qualities of both of the original products.

Timber is defined as sawed wood, 4 by 4 inches or more in dimension. Lumber is timber sawed or split for use.

POPLAR REPLACES CHESTNUT DIFFICULTIES OF PLANTING

According to the United States Forest Service the yellow poplar is replacing the blight-killed chestnuts in the Appalachian region.

Concerning planting this species the statement says:

"It was long thought that yellow poplar was too difficult to propagate to make reforestation efforts profitable. Forest service investigations, however, show that planting is practical under proper conditions.

"In spite of extreme adaptability and wide range over most of the Eastern and Southern States, the yellow poplar or tulip tree is capricious in its refusal to grow under many conditions. Soil and moisture conditions must be good, but just enough and not too much shade seems most important to the survival of the seedling. The young yellow poplar usually will not thrive well in close competition with other vigorous hardwoods. It should be planted in open spots, and some provision made for subsequent thinning of competing trees."

PINES FOR PULPWOOD

The waste involved in cutting small trees for pulpwood is shown in a recent study made by the Southern Forest Experiment Station of the United States Department of Agriculture. In thinning a second-growth stand of loblolly and shortleaf pines in north central Louisiana, the cutters found that trees 4 inches in diameter at breast height yielded an average of only 1 billet, and 178 of these 4-inch trees were required to make a cord of pulpwood. In a 7-inch tree there were 7 billets and only 18.7 trees were required to make a cord. A 2-man crew took more than twice the time to cut a cord from the 4-inch trees than it required to cut a cord from the 7-inch trees.

Waste of both material and time may be avoided if only trees which are at least 6 inches in diameter are utilized, the station reports. As a result of the removal of the larger trees, the smaller ones left will have more room and their rate of growth will increase.

WOOD FLOUR

Wood flour is a commodity which is comparatively little known to the general public. It is usually made of wood or low resinous content. It is ground to a fine powder or flour, as the name indicates, and is used in the manufacture of plastic wood and artificial carving. In some places in Europe it is used to coat bread dough before baking to give a golden brown crisp crust.—Service Letter (Pa.).

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No. 3

SUMMARY C. C. C. WORK OF TWENTY-SIX CAMPS

Large Forest Area Mapped, Useful In Planning Fire Protection and for Information as to Timber Sup- ply—Fire Fighting Record of Camps Given

A summary of six months of actual work done by 26 CCC camps under the direction of the Georgia Forest Service, as of February 1, is as follows:

Miles of telephone lines.....	158.3
Miles of firebreaks.....	1,490.4
Acres reduction of fire hazard along firebreaks.....	10,854.
Number of lookout towers.....	7.
Number of lookout houses.....	3.
Miles of truck trails.....	232.2
Miles of maintained truck trails	353.2
Miles of foot and horse trails....	108.3
Acres of forest mapping.....	1,195,370.
Miles of lineal surveys.....	82,169.6
Number of bridges built.....	514.
Man days fire fighting.....	13,236.

The telephone line construction centers around the lookout towers and is for the purpose of summoning fire fighting crews.

Firebreaks and truck trails are for the purpose of checking fires. In south Georgia the firebreaks are 25 to 30 foot strips, cleared of vegetation, and plowed. These are classed as primary firebreaks. Timber owners are obligated to construct secondary firebreaks. Truck trails in south Georgia are firebreaks on which bridges are constructed to facilitate the movement of trucks carrying fire fighting equipment into the forests.

In the mountains, the firebreaks are generally truck trails to make the forested regions accessible for fire fighting purposes.

The 10,854 acres from which fire hazards are removed are strips along firebreaks and truck trails where dead snags are removed to prevent embers that under high winds would be carried across the firebreaks.

The lookout towers serve for spotting fires over a radius of several miles during the fire season, and the telephone connec-

tion assists in getting quick movement of fire fighting crews.

The lookout towers, firebreaks and telephone lines are permanent equipment and are to be maintained in the future by the land owners belonging to timber protective organizations.

Extensive Area Mapped

State Forester Lufburrow is especially pleased with the 1,195,370 acres of forest mapping which has been accomplished. These maps show not only the physical features of the land, but the types of forest land, whether pines or hardwoods or mixtures. It is the first information of this sort ever obtained on so large an area in Georgia.

These maps provide basic information on which to develop future fire protection plans, giving as they do, the type of timber, fire hazards, streams and general information as to where to establish firebreaks and sources of water for fire fighting.



Two-year olds—Georgia Peach and Georgia Pine.
Young daughter of District Forester H. D. Story,
Jr., Albany.

CODE FIXES TIMBER CUTTING FOR SUSTAINED YIELDS

Code Authorities now Have Auth- ority to Enforce Selective Log- ging and Fire Prevention on Pri- vate Lands for Public Welfare

Woods practices designed to assure forest conservation and sustained yields on privately owned lands, are now a part of the Lumber Code with authority to enforce for local and national welfare. Announcement to this effect was made in Washington February 10, following a conservation conference held the latter part of January.

At the Conservation Conference committees representing the various regions of the country submitted rules that were declared inadequate. These committees were ordered to revise their rules, specific statements being made to indicate how they should be amended to meet the lumber code requirements for promoting forest conservation and sustained yields.

Following the revision of the regional rules in line with the suggestions offered, the code authority issued regulations that have such legal status as will permit of adequate enforcement.

It is apparent that the enforcement of the logging code will call for the services of trained foresters, thus enlarging the functions of forestry departments.

Speaking of the demand for specific rules governing timber conservation, F. A. Wilcox, Chief of the U. S. Forest Service says:

"The demand for more specific rules of practice is drastic, but indicative, I believe, of an attitude of good faith and determination by leaders in the lumber industry to redeem the public responsibilities to which they are pledged by their code. I believe, and I feel that leaders in the lumber industry recognize that public opinion will no longer tolerate the 'cut-out and-get-out' policy of forest exploitation which for decades has taken no account of local or national public welfare."

If the price of recognizing Russia is the importation of Russian lumber, the forest and lumber industry of this country will pay it.

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C. C. C. WORK CONTINUED FOR ANOTHER TWELVE MONTHS

The ECW projects, involving the employment of CCC workers on forest lands has been extended twelve months. The enlistment of men will, however, be for six months periods, as heretofore.

In Georgia the number of camps will apparently be reduced as work is centered more on national forest and national parks. The southern states that obtained northern camps during the winter, will apparently find their quota reduced during the spring, summer and autumn.

The reenlistment of men every six months does not mean that the camp supervising personnel is reemployed at the end of six months. Their employment is continuous as long as their service is satisfactory. Much more work is expected from each unit in the coming six months periods, since experience has taught efficiency.

Believe It or Not

The following item appeared in a February expense account: "For repairs to 2 fire pumps frozen while fighting fire". These are hand pumps carried on the back of fire fighters.

The spring smoke haze is sweet incense to Satan, arising from burnt sacrifices of forests.

NAVAL STORES CODE SETS TREE LIMIT

Effective February 19, Production to be Regulated Under Control Committee and Prorated Annually

Upon the approval of the United States Secretary of Agriculture, a naval stores production code became effective February 19. The primary object is to regulate production in line with the consumption demand. To this end processors are to be controlled.

From the standpoint of forestry, an interesting phase of the regulations is that no trees under nine inches in diameter can be chipped, and only one face can be allowed on trees under 14 inches in diameter. These requirements are in keeping with good forestry practices, and, in fact, are supported by economic considerations in gum production. As in the case of straw timber, where a code regulates the size of trees to be harvested in the interest of conservation and sustained yields, chipping of pines is so ordered as to perpetuate the naval stores industry on a sustained yield basis.

As is well known, trees less than 9 inches in diameter are quite generally chipped, and the trees are so weakened that they blow over or die. Trees under 14 inches in diameter are also often chipped with two faces and are so weakened as to blow over or suffer a severe setback in growth.

The code covers not only production of gum in the forests, but processing. It will be administered by a control committee of nine members, which at the time this is written, has not been named. An advisory committee, without vote, is to sit with the control committee and is to be made up of two persons selected by factors, two selected by dealers, and two selected by the Secretary of Agriculture to represent the public.

By October 15 each year the control committee is to estimate the stock on hand and consumptive demand, and on this basis fix a production quota for the year, which is allocated to processors according to their average production 1930 to 1933; provision is also made for new producers. Applications for allotments must be accompanied by payment of three cents per barrel of turpentine and one cent per 100 pounds of rosin.

Each package or container of gum, turpentine or rosin shipped by the original processor, or distiller, must bear an identifying stamp or metal tag, date of production and specification of contents. Tags are to be provided by the control committee according to the assigned quota of production.

EROSION CONTROL PROJECT PLANNED FOR CLARKE CO.

Special Project Under Soil Department of State College of Agriculture obtained from Department of Interior

Press dispatches announced in February the acceptance by the Soil Department of the State College of Agriculture of a soil erosion project offered by the Department of Interior. The site of the demonstration is in Clarke county, north of Athens, on the drainage area of Sandy Creek. The project is headed by Glenn Fuller, soil specialist of the college, with W. O. Collins, head of the soils department, acting in an advisory capacity.

On the area is considerable eroded and sub-marginal land, which is to be recovered for use by soil binding vegetation, including tree planting. Gullies will be dammed, terraces constructed, stream beds rendered less subject to overflow. Land utilization will be according to adaptability of soils.

As a result of the work to be done, typical Piedmont soils rapidly deteriorating under present methods of handling, will provide a demonstration of what to do to restore such lands to their best possible uses.

NATIONAL FOREST LAND DISTRIBUTION IN GEORGIA

The Nantahala and Cherokee national forests are partially located in Georgia. The annual report of the Commission on National Forest Reservation for the year ending 1931 shows that 260,489 acres have been acquired of the 336,954 acres approved for purchase in the State of Georgia. An average of \$5.83 per acre has been paid, or \$1,572,695.38 total.

National forest acreage acquired in each county of Georgia is as follows: Dawson county, 2,690 acres; Fannin, 38,134 acres; Gilmer, 301 acres; Habersham, 13,769 acres; Lumpkin, 48,148 acres; Rabun, 88,431 acres; Towns, 1,442 acres; Union, 40,061 acres; White, 36,232 acres.

Approval for the purchase of 17,286 acres in Murray county has been given, but none has been acquired.

Where Wild Flowers Will Not Bloom

Wild flowers do not beautify the woods that have been burned over this season. In their place are blackened tree trunks, plentiful dead seedlings and an air of desolation pervading the woods.

Those who enjoy the wild flowers, and tourists who enjoy the beauty of the way side, will seek other places and other routes of travel to escape the depressing influence of a seared landscape.

NATIONAL BENEFITS OF SIX MONTHS CCC FORESTRY WORK

Report of Robert Fechner Shows Accomplishments of Hastily Organized and Quickly Planned Activities of Untrained Men in Forests

According to a report made by Robert Fechner, director of Emergency Conservation Work, covering a period of six months activities of hastily organized and quickly planned activities of an army of untrained men located in 1,522 forest camps, a service of real benefit to the nation has been rendered. The efficiency of the CCC men is increasing as well as the planning of the projects of work. A summary is as follows: 409,932 man days have been given to fighting forest fires; 25,750 acres have been planted to trees on national forests; 67,784 man days have been devoted to collecting seed and establishing tree nurseries; inflammable fire hazards have been removed from 129,962 acres; 10,058 miles of truck trails have been constructed; 5,058 miles of telephone lines have been built; 3,197 miles of fire-breaks have been established; 6,629 miles of roadsides have been cleared of fire hazards; 1,700 lookout towers, lookout houses and tool caches have been erected; 800,150 acres have been given insect pest control; 1,675,911 acres have been treated for the eradication of tree and plant diseases; rodent control has extended over 3,566,978 acres.

Forest stand improvement has been given to 205,159 acres; 4,299 bridges have been constructed.

Erosion preventative measures on 388,034 acres have been completed; 68,450 erosion control dams have been built.

Numerous smaller activities have been carried on.

Of the 1,522 camps in the United States 1,250 are under the general supervision of the U. S. Forest Service, 177 under National Park supervision, 71 under the Bureau of Indian Affairs, 28 under the U. S. Chief of Engineers, 3 under the Bureau of Biological Survey of the Department of Agriculture, and 1 under the General Land Office.

EXPECTS PULPWOOD FROM FIVE-YEAR OLD PINE

Marion Renfro, Quitman, Georgia, who has conducted an intercropping experiment of corn and pines for three growing seasons, is expecting to grow slash pine to pulpwood size in five years.

At the rate pines have been growing in spite of severe drouths the land has suffered, it looks as if the goal will be attained. Dr. Charles H. Herty, director of the pulp and paper laboratory at Savannah, has his eyes on these pines and expects to find them of pulpwood size at the end of the five-year growth period.

SPRING FIELD FIRES THAT BECOME FOREST FIRES

Woods Suffer Heavy Damage in Georgia as Result of Failure of Farmers to Keep Debris Fires of Fields from Spreading

March and April are seasons of heavy forest fire losses in farming sections of Georgia, because many farmers clearing up fence rows, terraces and old land for plowing set fires to the field litter and then do not guard the fires to keep them from entering the woods.

Fires in the woods when the sap is up do more damage to trees than at other times. The fire toll in forest damage would pay the taxes on the land several times over.

Those who think that forest fires do not do much if any harm, have never given the matter much thought. If they had, they would know that the seedlings are killed; that the bark of the trees is scorched, leaving scars in which rot enters; that forest insects do more damage to trees that have suffered from fire than to other trees; that fire reduces the fertility of the soil and slows up tree growth; that more water runs off the burned-over forest floor and less seeps down in the soil to supply springs and wells; that heavier surface run-off of rain increases soil washing; that the materials washed from soil gullies fill up stream beds and cause overflows that are damaging the bottom lands.

Some farmers do not care if the woods do burn off, because they think boll weevils are killed by the flames. But the boll weevils do not hibernate in the leaves, therefore, they are not killed. Some purposely burn off the woods to improve woodland pastures, but in doing so they are killing out the best pasture grasses and allowing only the poorest, such as sedge grass, to survive.

Burning off the woods is burning up woodland profits. The woods will be a safe savings bank if fires are kept out and the trees let alone to make the growth that nature can provide.

Be careful with field fires.

Garden Club Stresses Forest Fire Protection

A meeting of eight garden clubs, held at Marietta, Georgia, stressed forest fire prevention, reforestation and preservation of natural beauty. Mrs. M. E. Judd, Dalton, member of the Commission of Forestry and Geological Development of Georgia, spoke to the clubs on the importance of forest fire prevention and how the state forest service has organized two million acres of timberland for intensive fire protection measures.

Too often the desire for a dime today rather than a dollar tomorrow has ruined a fine young forest.—Page S. Bunker.

TREE PLANTING PERIOD ENDS WITH MARCH

Nursery Stock Short of Demand—Wild Stock can be used with Success if Simple Rules are Carefully Followed

Tree planting should not be continued beyond March and would be better if it ended by March 15 in Georgia. Those who sought nursery grown planting stock, to find that the supply had been sold out, in many instances may find suitable planting stock on their farms or in the neighborhood. Excellent results can be obtained from planting wild pine seedlings if a few simple rules are followed.

Do not undertake to plant any but the small one-year old pine seedlings. If larger stock is planted the survival will be poor and the cost of digging up and preparing planting places for the larger trees will be unnecessarily heavy.

These one-year old seedlings may be 3 to 10 inches in height and may be found along old fields or in the open woods where fires have been kept out. Remove the seedlings from the ground with a spade, lifting them so that their root system will remain intact.

Place the seedlings in a bucket in water mixed with clay to a consistency of butter-milk and keep them there until they are planted. This is to prevent the roots from drying out. The clay in the water is to keep the seedlings from losing their sap or plant food content into the water.

Transplant the lifted seedlings as soon as possible to the land to be reforested.

Wherever possible, plow furrows at eight feet apart. In the turpentine belt they may be plowed 10 feet apart. A dibble, or narrow spade, driven into the soil and pushed back and forth will open a planting hole. Place the seedling upright in the hole and then firm the earth around it so that there will be no possibility of air pockets remaining around the roots. Many acres have been planted with pine wild stock in this way with nearly 100 per cent success.

Where there are raw gullies, it is well to put in the planting holes some top soil or woods earth to help the seedlings get a start. In planting the bottoms of gullies, stones and grass or other material should be used to make dams, and good earth should be thrown in above the dams to give the seedlings a chance to establish themselves.

Georgia has a large area of abandoned farm land that has eroded and is too poor to grow agricultural crops profitably. This land can never be economically reconverted for agricultural uses unless they are set to trees. They are likely never to bring in any income unless it is through tree products. These eroding lands, if left unreforested, are a constant menace to the better lands. The sand and gravel carried

from the bare uplands fill up stream beds, cause overflow of bottom lands, often resulting in scouring away rich soil, or leaving a deposit of worthless sand and gravel where the rich soil was.

A good farmer will utilize all his land, rich and poor, and the best way to use the poor is to let it grow trees.

NAVAL STORES DISPLAY IN STATE MUSEUM

Materials are being collected to make a display in the State Museum on the fourth floor of the State Capitol building in Atlanta. This display is being installed by order of the Commission of Forestry and Geological Development to supplement the splendid displays of minerals, woods, fish and game, plant insects and diseases, indian relics, farm crops, etc., already in the museum.

The naval stores display will embrace methods of chipping, boxing, samples of rosin by grades, turpentine, and by-products.

Samples of chipped logs and cups are provided from the federal forestry experiment station at Lake City, Florida; samples of gum by Harris King, state inspector of naval stores, Savannah; chipping tools by the Council Tool Company, of Wananish, North Carolina. The Georgia Forest Service presents placards and by-products.

The exhibit will provide an illustrative picture of the naval stores industry in which the State of Georgia leads. It will doubtless be interestingly educative to the thousands who annually view the exhibits in the State Capitol.

RED OAK SUITABLE FOR MAKING BEER BARRELS

White oak has been the standard material for beer barrels, but the Forest Products Laboratory at Madison, Wisconsin, has suggested means of using red oak.

The pores of red oak do not contain tyloses that clog the pores of white oak, hence the necessity of plugging the pores of red oak. This has been done by using ordinary brewers pitch with which all beer barrels are lined. The barrels are subjected to hot liquid pitch and calked at the groove of the barrel where the head is drawn in. So treated, the Forest Products Laboratory says, the red oak barrels hold both liquid and gas as well as white oak. Red oak barrels used by a Milwaukee brewery made five trips from the brewery without developing leakage.

DuPre Barrett, extension forester of Georgia, has a black walnut tree on his farm near Athens that is growing an inch in diameter annually. Mr. Barrett believes this tree holds the record on rate growth of the walnut.

MODEL COMMUNITY TO STRESS FORESTRY

Chancellorville Project in Putnam and Jasper Counties Promoted by the University System with Fed- eral Aid Plans Land Utilization

The Chancellorville Homestead project sponsored by the University System with federal aid, involving 30,000 or more acres, including full utilization of the land in which reforestation and forest management will play a part. Eroded and sub-marginal lands are to be reforested. Slopes of 12 degrees and over will not be used for agricultural crops. Forests will be used as erosion and flood control measures.

It is the purpose to plant a species of trees best suited to the region and the needs of the community, as well as for commercial possibilities. A self sustained type of agriculture is a chief objective. From a forestry standpoint this means fuel, fence posts and building material as of primary forest planning. The commercial forest returns will include pulpwood, crossties, poles, sawlogs, etc.

Foresters will help plan the program of timber production and aside from selected species of trees to grow on the various sites, will make plans for managing not only the newly planted areas, but the existing forests so as to promote the most rapid growth and the largest returns from the forests.

The lands being acquired are largely of the Davidson soil type, a dark red soil of excellent quality. Rapid tree growth will be obtained on these soils.

GEORGIA GROWN TUNG NUTS PRODUCE GOOD OIL YIELDS

Tung nuts of high average oil content can be grown in Georgia, according to the Georgia Experiment Station. Long time experiments at Experiment, Georgia, leads the station authorities, however, to say that the susceptibility of tung oil trees to cold injury has indicated that the crop can only be profitably grown further south in Georgia than Griffin.

A report of analyses made by the station chemical laboratory as to the oil content of nuts grown in Grady county, shows 58 to 68 per cent oil in the kernels.

Attention is called to the report of variations in oil content of nuts from different trees, indicating, it is claimed, that it would be worth while to select nuts from high oil producing trees, for planting. A series of experiments are to be conducted at the Coastal Plains Experiment Station at Tifton to see what can be accomplished by plant breeding methods to obtain high yields per tree of nuts with high oil content.

FORESTRY QUESTION BOX

Should black walnuts be planted on abandoned farm lands?

It is doubtful if much of the abandoned farm land in Georgia is suited to growing walnuts which are particular in their requirements. Success cannot be expected except on fertile, well drained, friable soils. Very little soil of this type has been retired from cultivation in this state. Usually, it is better to plant walnuts along fences, in fertile corners that cannot be cultivated, or along the more fertile borders of pastures, near buildings where they can be useful as shade, as well as for growing nuts and lumber.

Is it necessary to plant walnut seedlings?

No. Nuts can be planted in the spots where trees are desired, with good success. Some nurserymen are, however, growing improved varieties that yield large and superior quality nuts. If nuts are an objective in growing walnut trees, planting stock may be obtained from nurseries specializing on quality nuts.

What is causing my pines to die?

An inspection of the mixed hardwood and pine forest where the pines were dying, revealed that the trouble was the southern pine beetle. Some hardwoods had been cut in the forest when the sap was up. The odor of freshly-cut wood attracted the pine beetles. They went to work on the weaker pine trees, with the result that many of them are dead.

The dead and infested trees were being cut out and removed in February. The removal of the infested pines is the only practical control measure.

These pines should of course not be cut except in the dormant period of fall and winter when the pine beetle is not active.

Is the honey locust as good as the black locust for growing fence posts?

No. The honey locust is not in the class with black locust for durability in contact with the soil. The black locust will grow to fence post size more quickly.

CCC Men Fight Fires

According to the state forester, the CCC men have done good work in fire suppression. In south Georgia, where a long drought prevailed and the fire hazard was great, numerous outbreaks were combatted. The 13,236 man days given to fire fighting represent fighting 190 fires up to January 1. But for the work done by the CCC men the area covered and damaged by the outbreaks would have been far greater than it has been.

FIRST DISTRICT**W. D. Young, District Forester
Rome**

Camp P-58, at Ellijay, boasts that it has a side-camp which they believe is located at a higher point than any other camp in the State. This side-camp is located on top of Rich Mountain, 4,000 feet elevation, and consists of fifteen men. Foreman Walter Crowe states that the boys are having a good time, especially during the week ending Saturday Feb. 10th, when they had about four inches of snow. This side-camp is located at this point for the purpose of constructing a lookout tower and quarters, and will continue for the remainder of the work period. Food and supplies for this side-camp are brought in by pack-mules, as the tower is located on an almost inaccessible point.

Mr. Jones, Inspector, U. S. Forest Service, made a visit recently to camps P-58, Ellijay, and P-77, Tate, and commended the camp superintendents on the type of truck trails which they have completed. Also Mr. D. L. Dorward, of the Asheville Office, U. S. Forest Service, recently made an inspection trip to these two camps.

As a result of CCC activities, Pickens County TPO has been increased from around 14,000 acres, to 50,000 acres under protection.

SECOND DISTRICT**E. B. Stone, Jr., Dist. Forester
Gainesville**

Much work has been accomplished by the CCC boys in the northeastern part of the State as a result of a comparatively mild winter, and with the opening up of spring, plans are being rushed with the contemplation of accomplishing even more work with milder weather.

Many beautiful trails have been constructed through the mountains, all of these being well and fully marked with rustic signs so that any hiker can now find his way through the mountains quite easily. Also the Georgia portion of the Appalachian Trail which reaches from Maine to Georgia has been greatly improved and well marked. Nature lovers all agree that the full beauty of the mountains can be better enjoyed and appreciated by hiking over these trails than any other way. Fire lookout towers are being constructed on the highest peaks, and for sightseers who really want to see, these will prove a center of attraction.

The improvement of numerous truck trails through the mountains will enable motorists to pierce them to the inner regions where rainbow and speckled trout are found in abundance in the streams. Many other forms of wild life can be found in these mountains which many "City Fellows" have never looked on before. Some of these rare specimens have been mounted

and can be seen on display at the CCC camps. A great many of these roads are already completed.

Visitors are always warmly welcomed at the CCC Camps, and we hope to have a great many visitors this spring and show them what Uncle Sam's boys are doing.

THIRD DISTRICT**C. N. Elliott, District Forester
Augusta**

A weekly paper is being issued from camp Liberty, CCC Camp No. P-64, at Crawfordville. Although his name does not appear on the paper, Charles Hinkle is Editor-in-Chief of this new publication. The name of this paper is ALABAMA-GEORGIAN. Much information about the activities of the camp is contained in this paper. The "cracks" in the column "Chips" rates with the best of newspaper columns, and some of them may appear shortly in "Topics in Brief" in the Literary Digest.

Mr. Hinkle is to be congratulated on the skill with which this periodical is written and put together. Copies of it may be secured from Camp P-64, at Crawfordville. The subscription rates are: Weekly, 3c; Monthly, 12c; Quarterly, 35c, and Semi-annually, 70c.

An item from "Chips" reads:

"After dealing with an American lawyer, a foreigner is apt to think this is the home of the fee".

A camp has been recommended for the TPO's located in Jones and Jasper counties. These organizations, Falling Creek and Jasper County TPO's, embrace some 32,000 acres of wooded land, and are at present being protected from fire by the owners. Primary fire breaks have been recommended as work to be done. Citizens of both counties are very much interested in this camp.

Plantings of seedlings to date in the Nixon State Forest near Augusta are: Cypress, 25,000; Longleaf Pine, 10,000; Slash Pine, 7,000; Black Walnut, 20,000; Red Cedar, 5,000; Black Locust, three pounds. The tool house, 18 by 24 feet long, of twelve inch Cypress logs, is under construction. The forest is set up as a model forest area for this section of the state. The public is invited to inspect it at all times.

Plans for the renovation of the Alexander Stephens home in Crawfordville, have been approved. The home is located on the Alexander Stephens Memorial Park, and the work will be done by CCC Camp P-64 at Crawfordville. Stephens' home is located on State land.

A minister was asked: "Will people who chew tobacco go to heaven?"

He answered, "Yes, but they will have to go to hell to spit."

FOURTH DISTRICT**W. G. Wallace, District Forester
Columbus****Forest Fire Notes from P-56
and P-78**

Here is the result of a little figuring based on the T. P. O. forest fire report summary covering the period from July 1, 1933 to January 31, 1934 for the two CCC camps in this district, viz: P-56 at Warm Springs, and P-78 at Butler.

The total area signed up in the two TPO's, and being protected by the two CCC camps, amounts to about 202,000 acres of forest land. The report shows a total of 46 fires which burned over a total of 2227 acres, or about 1.1%. We do not call this an outstanding record, nor do we attempt to compare it to that of any other section of the state. It is, however, a very good record when considering the fact that 170,000 acres of the total now being protected was not under organized fire protection prior to last July. This new acreage has the disadvantage of not having yet developed its presuppression activities, especially along the lines of forest fire education, as much as the old TPO area has. We are led to believe that with continued protection the number of fires and acreage burned can be gradually lessened.

Placing the damage by these fires at a normal figure of one dollar per acre, which is certainly too low, shows the following results: \$2,227.00 actual estimated fire damage as against a minimum of \$14,140.00 damage based on an estimate that at least 7% of the area would have burned if not placed under organized protection. Even these conservative estimates show that organized fire protection pays. Double the low estimate of 7% the probable area that would have burned if unprotected and you will in all probability be nearer right. The normal figure of one dollar per acre should only be applied towards actual damage. Actual and potential damage will come nearer tripling this amount. It is believed that during the past seven months these two camps have saved the landowners in these two TPO's not less than \$75,000.00.

Concerning the effect of the lumber code on the price of lumber, Charles Green, Laurell, Miss., Administrator of the Southern Pine Division, says the average price of today under the code are less than in 1923, though wages are 15 per cent more than then.

A lady motorist was driving along a country road when she spied a couple of repair men climbing telephone poles. "Fools!" she exclaimed to her companions. "They must think I never drove a car before."

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Treutlen County T. P. O.

In addition to the Primary Fire breaks constructed by Camp P-61, Soperton, Ga., the members of the Treutlen T. P. O. have constructed 250 miles of secondary breaks.

They also have made an assessment on each member to cover cost of telephone service in the two tower system of detection, which was put in by the camp and consists of 10 phones and twenty-six miles of telephone line.

The secondary firebreaks are of the plowed and burned type, consisting of two furrows plowed fifteen to twenty feet apart and burned out between. Fire breaks of this type are used to supplement the twenty-five foot cleared and plowed primary breaks which were constructed by Camp P-61. These breaks are put in to give landowners added protection and they are eligible for fifty per cent refund under the T. P. O. set up for this type of work. Plowed and burned secondary fire breaks of the above type cost three dollars per mile.

Camp Superintendents Meeting

On February 17th, a meeting of all Camp Superintendents in District Six, was held in the Savannah District Office. Superintendents attending were C. J. Martin, P-53, J. J. Walker, P-61, A. A. Simonton, P-82, E. T. Gabriel P-81, W. F. Whatley P-63, and C. B. Ellington P-57. Several items of importance were taken up concerning the work.

Superintendents were given instructions on strength reports, as not enough men had been getting into the woods. Other things taken up were progress reports, gasoline and oil reports, care of tractors and trucks; sick and annual leave were explained and how it should be handled. Each superintendent was urged not to use long distance telephone unless it was absolutely necessary, and hold the bills down to a minimum.

Oconee T. P. O.

Members of the Oconee T. P. O. have constructed one hundred miles of fire breaks during the quarter ending January 10th. They are of the solid plowed type, twelve feet wide, constructed with mule teams and two horse turning plows. The Oconee T. P. O. contains twenty-two thousand acres and is composed of sixteen members. A solid plowed fire break constructed in the above manner will cost four dollars per mile. The members of the Oconee T. P. O. have already received their fifty per cent refund on their fire break work.

Tower Construction

Five steel lookout towers in this district have been constructed to date, which completes the quota of towers for the Savan-

nah District. Two eighty-foot towers were constructed in Treutlen county by Camp P-61, and three one hundred foot towers in Liberty and Long counties by Camp P-53.

A fence of cypress poles has been built around each tower site and tool houses have also been constructed at some of the sites. These houses will be used to store fire fighting equipment for use in fighting forest fires.

Each tower is also equipped with a telephone and later on when all the mapping has been completed, each tower will have a map mounted on a table for use in locating forest fires.

SEVENTH DISTRICT

**C. B. Beale, District Forester
Waycross**

General ECW News

Down at Fargo on the edge of the Okefenokee, where roads are still few and far



A bridge 859 feet long made by CCC boys at Fargo under Foreman E. C. Bailey

between, the frontier of fire protection is pushing out into isolated places. Superintendent Myers, Camp 59, has constructed a bridge 859 feet long across Jones Creek, making some 20,000 acres of pineland 5 miles nearer to Fargo, and an hour nearer for fighting fire.

The bridge is constructed of heart cypress, furnished by "Bill" Oettmier of the Superior Pine Products Company. Timber for the substructure was cut, dressed, hauled, to the site and cut to fit by the CCC boys.

Notes on T. P. O.'s

At recent meetings of the various TPO's in this district, a new and more intensive sentiment towards better organizations for greater fire protection has come forward. The TPO's all have energetic and capable secretaries, the majority of them full time men, with regular salaries, and an office, elected by a board of directors and directly responsible to the board.

The Consolidated, of Clinch, Atkinson

and Ware counties; the Brantley County, and the Appling County TPOs were leaders in employing full-time secretaries, and now the Coffee County and Jeff Davis County TPO's have consolidated with renewed enthusiasm and will employ a full-time man. The Wayne TPO is employing a paid manager.

With the activity of the secretaries, the protected area in this district should reach two million acres by summer. There are approximately 1,800,000 acres in the TPOs now.

With this issue, all nine of our 100 steel lookout towers will be completed and in service. The superintendents are busy connecting them with telephones now. In addition to the ECW towers, the Wayne County TPO is completing plans for two 100 ft. wooden towers; the Appling County TPO has made plans for two, and the Coffee, Jeff Davis TPO will construct three. All of these towers will be put up by CCC labor; the TPOs furnishing all the materials. We already have plans and specification for these towers.

CCC News

P-60, Colesburg, has completed laying cable across the Satilla river at Woodbine, connecting the northern portion of Camden county and the southern portion with telephone service. The three old TPO towers and the two new ECW towers are in operation in Camden County, giving that area 100 per cent tower service. The cable across Cumberland river to Cumberland Island will be completed at an early date, giving the island telephone connection with the other TPO members. Application has been made for a side camp on Cumberland island and Superintendent Bailey hopes to begin constructing fire breaks there at an early date.

Application for a side camp near Pason, in Atkinson County from P 52, Homer, has been submitted. The Homer area consists of some 350,000 acres, part of which is in Atkinson County.

(Continued on Page 8, Col. 1)

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

A VISIT TO JUGTOWN

By
RICHARD W. SMITH
State Geologist

One of the most interesting mineral industries of Georgia is pottery or jug manufacturing, represented by small plants, scattered throughout the State. Using local clays, home-made equipment, and methods that were old in the days of Omar Khayyam, they turn out "stone-ware" jugs, churns, pitchers, flower pots, vases and urns desired for their artistic quality as well as for their usefulness. The industry is in the hands of descendants (sometimes of the third or fourth generation) of potters who came over from the famous pottery

and gives body to the clay. These clays are mixed in the proper proportions and "tempered" with just the right amount of water in a large circular pit in the ground. A circular stone or log is moved around in this pit by mule or horse power, thoroughly kneading the clay to the proper consistency. Several weeks' supply is usually mixed up at one time and stored in a damp place.

All of the ware is made by hand on the potter's wheel, a horizontal disk that can be revolved by foot power, the speed varying to suit the potter's convenience. Let us observe the potter making a jug. The proper amount of clay is weighed out on a crude scale, given a final kneading to remove air bubbles and placed on the cen-

ter of the potter's wheel. Close to the wheel are a pan of water for the potter to keep his hands wet, a sponge, and a gauge to show the height of the jug or a pattern of the outside profile.

He starts to revolve the wheel, first making a hollow in the center of the lump of clay and then gradually shaping it with his hands into a tall cylinder the size of the jug. It is fascinating to see the clay grow upward and become thinner walled. When the proper height, thinness, and smoothness has been attained, the potter circles the top with his two hands and starts to slowly narrow in the neck, finally finishing the inside with his forefinger. The outside is then smoothed off to smooth out the hand marks. He then stops the wheel, rolls out a piece of clay, sticks it on for a handle, and with a wire cuts the finished jug from the wheel and lifts it off to a drying board. If you were now to cut it open you would be amazed at the thinness and uniformity of the walls. Making the pots looks so easy to do, but it really requires much skill.

The jug must now be dried for several days, first inside the little building, and later out in the sun. Before it is ready to be fired it should receive a coating of glaze. Two types of glazes are common in Georgia. One made from sand and lime, fires to a light greenish-gray to brown color. The very rich dark-brown glaze often used, is made from a very fine silt or mud from the bottom of the Hudson River north of New York City. Whichever type is used, the glaze material is mixed with water to the consistency of cream. The jugs are dipped in it and dried again before firing. The firing is usually in a crude rectangular kiln with an arched roof. A fire box is at one end, and a stack or chimney at the other, so arranged that the heat will go to the top of the kiln, down through the ware and out the stack. The pieces are carefully placed in the furnace so that they will not touch each other, and the door is bricked up and sealed with mud. Wood fires are used and the heat must be slowly and carefully increased. The process takes two to three days and a temperature of about 1700 deg. F., to 2000 deg. F. is reached. An even longer time is necessary for the kiln to cool off before the door can be taken down and the finished ware removed. Too sudden cooling would result in breaking or cracking the ware that was so painstakingly made.

I want to urge the reader to visit the nearest "jugtown" and see the potter at work. You will be fascinated with his artistic products, beautiful in line as well as in the color of the glaze, and you will find them surprisingly cheap. You will find potteries near Cleveland in White county, at Acworth in Cobb county, on Paces Ferry Road north of Atlanta and near Hapeville, south of Pine Mountain in Upson county, at Alvaton in Meriweather county, near Lizella in Crawford county, near Chalker in Washington county, and at other places that do not come to mind. Treat yourself to the pleasure of a visit to one of these potteries.

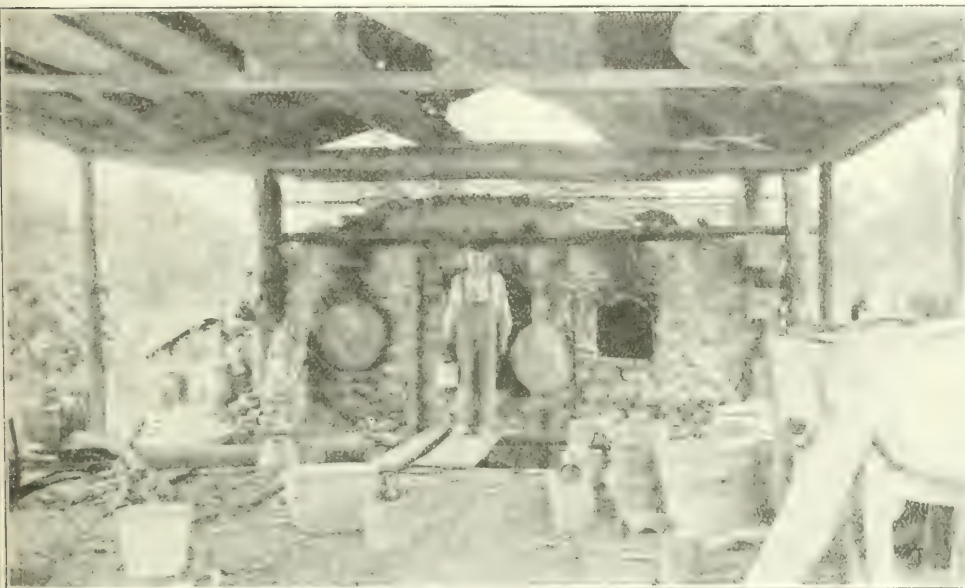
An American passing through an English village stopped to talk to a farmer.

"Do you get much rain here?" he asked.

The farmer shook his head. "A little but not much," he said. "My neighbor over there gets more than me."

The American seemed puzzled. "Well, I surely don't see that, sir," he remarked. "Why your neighbor is only about a hundred yards away."

"Yes," said the farmer, "but he has more land than I have."



Unloading a kiln at one of the Georgia Potteries.

sections of England. They have been trained from childhood to the work and take great pride in their craftsmanship. Let us visit one of these potteries and assume that we can stay long enough to see every step in the process.

The first step is the preparation of the clay. A mixture of a swamp or stream clay and a hillside clay is generally used. The blue-gray swamp clay has excellent plasticity but usually has too high a shrinkage and will probably fire at too low a temperature. The hillside clay may be an impure kaolin if the pottery is in the coastal plain section of the state, or a clay weathered from a granite or other felspar-bearing rock in the piedmont and mountain sections. It reduces the shrinkage

of the pottery. He then stops the wheel, rolls out a piece of

(Continued from Page 6, Col. 3)

T. H. Browne, Superintendent P-52, Homerville, was married early in February. He and his bride, formerly of Valdosta, are residing at the Musgrove Hotel in Homerville. Browne is the fifth forester to get married in this District since last summer.

EIGHTH DISTRICT

**H. D. Story, Jr., Dist. Forester
Albany**

P 75—Ft. Gaines Camp

The Civilian Conservation Workers at the Cotton Hill Camp are getting their stride and are turning out fire breaks and truck trails in record time.

The Cemocheechee Timber Protective Organization comprises an area of approximately 100,000 acres of which 70 per cent is timber land and the greater portion of the remaining thirty per cent is abandoned farm land now restocking. The topographic features are such that truck trails are necessary in order for crews to reach now inaccessible areas. To date a great many pole bridges have been constructed which are not only serviceable but are roughly artistic in construction.

The fire detection problem has been solved by the camp superintendent who has erected a wood or pole tower 70 feet high which makes it not only possible to cover lands listed in the organization but serves for observation over a greater part of four counties.

Although the measles epidemic has caused the camps of the 8th District to be quarantined, and although the boys have been denied the privilege of visiting public places, they have retained their highest spirit and are entering the field each day enthusiastically as shown by their monthly progress report.

A fire reported at the close of the day's work is not confronted with a lagging, spiritless crew but is met by a crew of determined workers wielding fire flaps and fire pumps, who realize that the harder the fire is fought, the less acreage will be sacrificed, the greater the praise of their foreman and co-workers, and the sooner a warm supper and a soft bed.

Albany Nursery

The State Nursery has been unable to meet the enormous demand for planting stock this year but has distributed many thousands of seedlings of high quality to landowners who are going to plant many acres of idle land.

The quality of the seedlings produced from this nursery is all that can be desired, having sturdy stems, well developed top and stout, thrifty root system.

An interesting fact was discovered in the planting and cultivation of longleaf this year.

The soil being sandy, a great deal of damage was done last year by heavy rains which caused "sanding". In experimenting to off-set this, a layer of straw was placed over the beds and a layer of soil thrown on top ranging in thickness from about one-half inch on some beds to about 2½ inches on others. The seed were planted on top. The purpose of this layer of straw under the surface was to form a surface-mulch after the seedlings had penetrated it with their roots and the rains had washed the surface layer of soil off and left the straw exposed, and to prevent sanding.

On the beds where this straw was placed, with a covering of one-half inch of soil and less, the results were highly satisfactory as there was no loss from sanding; and where this layer of straw was placed 2 inches or more beneath the surface the results were quite unexpected and astonishing.

First, the beds treated in this manner when observed during the middle of our hottest days were moist at the surface, while the untreated beds were dry.

This layer of straw did not serve as an insulator to break the capillary action of the water as would reasonably be expected but served as a sponge which kept the surface layer well supplied with moisture.

Another interesting fact noted was that longleaf seedlings did not develop a large tap root which made them hard to lift and transplant, but developed a reasonably short stocky tap root and here was a stimulated growth in the lateral root system in this layer of straw beneath the surface.

The demonstration planting of the different varieties of pines at the nursery, although they have been planted only two years, show remarkable height growth and will in a few years serve beautifully as a back ground for the log cabin being erected, which is well under way towards completion.

PLANTS' STORED FOOD ADDS LENGTH ONLY

Food stored by a tree or shrub in its woody parts is subsequently used for growth, but only for growth in length—the formation of new shoots and leaves. It is not used to increase the thickness of the trunk or branches. Growth in thickness is accomplished only from food that has been made in the leaves a short time before.

This discovery was announced before the meeting of the American Society of Plant Physiologists by Dr. W. E. Loomis of Iowa State College at Ames. Woody plants do not grow thicker in spring until they have developed their leaves, Dr. Loomis said; and such growth in thickness can be stopped at any time in the season by stripping off the leaves or cutting off the lines of transport of food from leaves to trunk. Science News Letter.

HEAVY TOLL PAID FOR FOREIGN WOOD FIBRE

In 1932, the United States paid \$168,115,000 for foreign wood fibre products that could have been provided by this country. The records show that 54 per cent of wood fibre products come from abroad. Most of this is newsprint paper supplied by Canada, Norway, Sweden and Finland.

As long as red spruce was considered the only source of pulp for newsprint there was some reason for surrendering to foreign countries, for the United States had cut out the red spruce supply in the north; but now that there is no longer any doubt about southern pines and conifers of the west being well suited to the manufacture of white newsprint, continued tribute to foreign countries is unnecessary.

President Garvin of the Chemical Foundation, Inc., of New York, who has done much to support Dr. Chas. H. Herty in his successful research for developing paper from southern pines, forcibly urged in an address in Savannah, initiative on the part of southern capital in organizing and financing paper mills. He presented cost figures to show that the south has unequalled advantages for making paper and for establishing the pulp and paper independence of this country.

HUNTING INSECT CARRIERS OF DREADED ELM DISEASE

Trees forced by artificial means to put out leaves in December are helping in an intensive search for insects that spread the Dutch elm disease, which threatens the extinction of the American elm. Through the cooperation of the New Jersey Agricultural Experiment Station and the Boyce Thompson Institute, several small elms in full leaf in a greenhouse and growing in early summer were made available to midwinter to United States Department of Agriculture entomologists who are trying to run down the culprit insects.

Special gas treatment developed in the Boyce Thompson Institute broke down the trees' dormancy. At the same time certain beetles which may be carriers of the disease emerged in large numbers from longleaf infected with Dutch elm disease. These insects—the smaller European elm bark beetle, the elm snout beetle and the elm borer—have been turned loose in cages containing the artificially-leaved trees to establish their guilt, or innocence, in carrying a dangerous plant disease.

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DEPARTMENT OF FORESTRY AND
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No. 4

PAPER MILL CONSTRUCTION RESTRICTED BY CODE

Modification Sought to Encourage Development of Industry in South and to Help Country to Attain In- dependence in Paper Supplies

Through the leadership of Senator Richard Russell of Georgia supported by other Georgia representatives, an amendment to the paper and pulp code has been sought to the end that the south may not be hampered in developing paper mills, made possible by the discoveries of Dr. Chas. H. Herty that southern pines are adapted to the manufacturing of newsprint.

Since the purpose of the Chemical Foundation in financing Dr. Herty's work is to free this country from dependence on foreign countries for its paper supplies, and since Dr. Herty's discoveries have pointed out a way to achieve this independence, it would seem that nothing should be done to discourage the attainment of this independence in the shortest possible time.

While it is contended that the code as it exists does not forbid the construction of new mills, it is held on the other hand by Senator Russell that long and tedious negotiations under protest of the established industry would be necessary in setting up a plant in the south.

At a hearing on the proposed amendment, Dr. Herty said that southern producers would have a \$15.17 a ton advantage over foreign manufacturers on newsprint delivered at New York City. He pointed out that 70 per cent of the newsprint used in this country is imported.

That the northern paper mills of this country, now importing pulpwood, are unable to meet foreign competition was revealed when a paper mill representative testified that only 35 per cent of the existing production capacity of mills in the United States is now utilized.

Fire Hazard Recorder

An instrument has been developed that will automatically record the percentage of moisture in the duff on a forest floor, and the wind velocity. The records of the instrument reveal how combustible the forest litter is and the wind velocity, thus determining how severe a fire would be and what measures to use in combatting it.

THRIFTY PLANTATION OF SLASH PINE IN N. GEORGIA

Slash pine planted in Hart county on the farm of W. B. McMullen, hundreds of miles from its native habitat, is making excellent growth. Three growing seasons have passed since the pines were planted by DuPre Barrett, Extension Forester. The young pines have attained 6 to 9 feet of height in rows 7 to 8 feet apart and trees 6 feet in the row.

Measurements were made in March of this year that showed a number of trees have grown 40 to 50 inches in height last season. The stand is almost perfect. The two-acre planting was made on poor, eroded land that had been abandoned for agricultural crops.

Eight additional acres have just been planted to loblolly pines on a field adjoining the slash pine area. An excellent opportunity is thus afforded for comparing slash and loblolly growth on the Piedmont Plateau region of north Georgia.



Slash Pine, Hart county, Planted 3 years—
Extension Forester DuPre Barrett with yard
stick measures one year's growth.

GEORGIA NAVAL STORES MEN PRACTICE GOOD FORESTRY

Thinning, Planting and Protection Practiced by Operators on Their Holdings in Area Surveyed by Federal Agencies in Southeast Georgia

According to a report made by the Southern Forest Experiment Station, a survey has revealed that many naval stores operators of southeast Georgia are engaged in improving their forest holdings. Out of 29 reports received, 11 operators have practiced thinning or planting, or both. The area thinned by 9 operators amounted to 3,173 acres. Six operators reported planting on 980 acres.

The survey had covered by March 1 all stills in Ware, Atkinson, Clinch, Charlton, Glynn, Brantley, Pierce, Bacon and Camden counties.

The Southern Forest Experiment Station says: "The canvass aims to cover all turpentine stills and, so far as possible, all gum producers not operating stills in every county in the naval stores belt in the southeast. From these contacts, comprehensive and detailed data on ownership, production, yield and woods and stilling practices will be obtained. This information will be used to supplement and check the data taken by the forest survey crews in running their lines through this region."

It is appropriate to state, in this connection, that the naval stores operators in this region surveyed are credited by competent forestry authorities familiar with the entire naval stores belt, with being leaders in adopting not only good forestry practices, but improved methods of distillation. Many of them belong to the timber protective organization set up by the Georgia Forest Service for fire protection.

Buckeyes and Bees

The flower of the buckeye is considered poisonous to bees. Los Angeles county, California, was using the buckeye for reforestation when the agricultural commissioner of the state intervened on behalf of the honey industry which is important in that section.

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CAPT. I. F. ELDREDGE TELLS OF TIMBER SURVEY WORK

The plans and purposes of the timber survey now in progress in the south under the direction of Capt. I. F. Eldridge, with headquarters at the Southern Forest Experiment Station, New Orleans, were presented by Capt. Eldridge at the annual meeting of the Railway Development Association of the Southeast held at Atlanta March 14 and 15.

As a result of the strip survey now in progress, Capt. Eldridge stated that reliable information would be available to railroads and anyone else, giving the amount of available saw timber, trees of turpentine size, pulpwood and other resources of the forests, not only at present, but for the future, as determined by growth rate of trees.

He stated that reports on the first Georgia units of the survey would be available in six months.

Wrecked Motorist (opening his eyes):
"I had the right of way, didn't I?"

Bystander: "Yeh, but the other fellow had a truck."

Seeing a gasoline engine apparently reasonably priced in a catalog, a prospective customer wrote, saying, "Send engine No. 1336; if good will send check".

The firm replied, "Send check; if good will send engine."

FOREST CONSERVATION OBJECTIVES SOUGHT UNDER LUMBER CODE

Harvesting and Protection Measures Become Operative June 1—Great Step in Forestry Involved

Effective June 1, Article 10 of the Lumber Code, dealing with forest conservation practices, becomes effective. It is a great step forward toward sustained yields, the goal of foresters. No part of the lumber code received higher approval of President Roosevelt than this.

The basic rules for the conservation of timberland of the country as a whole, established by the Lumber Code are as follows:

1. Protection of standing timber and young trees from fire and other destructive forces.

2. Prevention of damage to young trees during logging operations.

3. Provisions for replanting the cleared land after logging, if sufficient advanced growth is not already present.

4. To leave, where feasible, some portion of the merchantable timber as a basis for growth and the next timber crop.

5. Partial cutting or selective logging shall be the general standard of forest practice.

A premium for the practice of sustained yields under these rules is awarded in the form of a 10 per cent increase in quotas of production.

These general rules are to be adapted to the requirements of terrain and climate in each regional division and sub-division under the code. These adaptations must be filed with the Code Authority by April 15.

ADMINISTRATION

The enforcement of the rules is assigned to the Code Authority of each code division which is required to set up an agency, or agencies, on forestry practices with non-voting public advisory representatives (state, federal and farm extension services) to formulate and enforce necessary rules of forestry practice.

Future timber leases are to be made subject to provisions of Article 10 and are enforceable against both operator and owner. Old leases will be enforced with due consideration for ownership equities.

Willing to Sacrifice Gooseberries and Currants

Blister rust is a deadly white pine disease. The rust goes through two stages of development, one on the white pine, the other on gooseberries and currants. In the campaign of eradication in Connecticut, J. E. Riley, state leader in blister rust control, announces that 7 out of 8 farmers readily consented to the destruction of their gooseberries and currants.

CONTROL COMMITTEE FOR NAVAL STORES PRODUCERS

Jacksonville, Florida, Selected as Headquarters With Carl Speh as Secretary in Charge.

The committee to administer the naval stores code was chosen by ballot and announced in early March. The membership, according to code agreement, was to consist of three producers from Georgia, three from Florida, one from North Carolina, one from Alabama, and one from Mississippi, Louisiana and Texas.

The members of the committee are as follows: W. L. Rhodes, Estill, S. C.; W. O. Wingate, Ocilla, Georgia; George Van, Augusta, Ga.; W. B. Gillican, Homerville, Ga.; A. F. Bullard, DeFuniak Springs, Florida; E. A. McCloskey, Lake City, Florida; R. L. Black, Gainesville, Florida; M. C. Stillworth, Mobile, Alabama; and R. M. Newton, Wiggins, Mississippi.

An advisory committee, allowed by the code, is made up of two consumers, two factors and two dealers. Herbert L. Kayton, Savannah and H. M. Wilson, Jacksonville, represent the factors.

The initial meeting of the committee was held at Jacksonville, Florida, March 7, at which time R. M. Newton, Wiggins, Miss., was elected chairman; A. R. Gilligan, Homerville, Ga., vice chairman; E. A. McCloskey, Lake City, Florida, treasurer and Carl F. Speh, Jacksonville, secretary. E. M. Sessoms, Jacksonville, has been appointed as representative of the Secretary of Agriculture. Jacksonville was selected as headquarters of code administration.

EFFECTIVENESS OF FOREST FIRE PROTECTION SHOWN

According to the United States Forest Service, only 1.1 per cent of protected units of productive forest lands of this country were burned over in 1932, while 93 per cent of lands burned over was outside of protected units.

Thirty-eight states co-operate with the federal government in fire protection under the Clarke-McNary Act report approximately 223,000,000 acres of state and private forests or potential forest land under some form of organized protection. The area is 55 per cent of the forest land classed as needing fire protection. The protected lands burned over in 1932 amounted to 2,904,350 acres, of which 498,970 acres are classed as not having a productive value, while 38,410,000 acres of unprotected forest lands were burned over.

The number of fires reported for protected units of state and private lands for the year 1932 was 55,575 as against 56,443 in 1931.

GEORGIA FORESTRY ASS'N. MEETS AUGUSTA, MAY 10-11

May 10 and 11 have been selected as the dates for the annual meeting of the Georgia Forestry Association to be held at Augusta.

The meeting of the executive committee, held at Augusta, over which President T. G. Woolford, Atlanta, presided, selected Dean Paul Chapman of the State College of Agriculture as a new member of the committee. The office of Secretary Bonnell Stone was moved from Atlanta to Oxford, where Mr. Stone resides.

Two prizes were offered to promote the forestry project in vocational agricultural schools, one for \$75 to the teacher doing the best work and another \$50 to the student with the best record in forestry, these to be designated as "Herty prizes" in honor of Dr. Chas. H. Herty.

Plans for a membership drive presented by Roland Turner, Atlanta, were approved. A program committee consisting of T. G. Woolford, Atlanta, Bonnell Stone, Oxford, and Thomas Hamilton, Augusta, was selected and suggestions for the program were discussed.

The committee on exhibits consisting of C. N. Elliot, Augusta, J. M. Mallory, Savannah, and Lee Trimble, Augusta, was appointed.

Forest and Erosion Control

"Torrential and unreasonable run-off must be changed to stabilized flows bearing the irreducible minimum of sediment and all evidence available indicates that forests are prime agencies in attaining this result.

"The menace of soil erosion annually assumes increased and more alarming proportions. Not only is a precious heritage of productive top soil slowly moving into less usable forms and locations, but river channels, reservoirs and other engineering works, and fertile farm lands at lower elevations gradually are being depreciated by deposits of sediment for which there are no practical means of removal." — L. F. Kneipp.

Animal Insect Enemies Important to Tree Life

Moles, mice, shrews and skunks play an important part in controlling insect enemies of garden, orchard and forest.

A threatening insect to tree life is the Japanese beetle which entomologists have found are eaten avidly by moles, mice, shrews and skunks. These animals were placed in captivity and found to prefer the grubs of Japanese beetles to other natural food placed before them. The conclusion is that these animals are to be valued and protected as a means of insect control.

STANDARD TURPENTINE PRACTICES RECOMMENDED

The Southeastern section, Society of American Foresters, at a meeting held November 11, 1933, adopted standards for turpentine practices. That portion referring to woods practices is as follows:

TREE SELECTION—Use a 9-inch minimum diameter limit. (There may be a latitude of 1 inch to 1½ inch, depending on growth rate of trees. Good 8 inch slash runs 40 barrels, poor 9½ inch longleaf runs only 35 barrels.

Eliminate poor trees such as spike topped, badly leaning, and suppressed trees with under 25 per cent cr. length. Select side under the best developed part of crown.

Avoid placing faces over scars.

HANGING CUPS—Use rustless or rust-free cups and aprons. Scribe face width at 1-3 breast high circumference or 12 inch maximum. Expose little or no wood below tins. Set cups level. Restrict incisions for tins to less than the depth of the streak. Install cups as low as practical.

Hogals are helpful in preventing heavy slabbing for seating cups. Gutter chisels or broadaxes and mauls maintain control over the depth of the incisions better than free-hand broadaxe strokes.

WORKING TREES—Height of face shall be 14 inches to 16 inches each season. Depth of streak shall be 5-8 inch for slash of 3-4 inch for longleaf. This may be modified for rapidly growing slash. The peak angle shall be 130 degrees for the first three years, not sharper than 90 degrees thereafter. In the absence of definite knowledge a square streak is recommended. Cut streaks weekly, except that double streaking is permissible in June and July (and August).

Maintain shoulders at the same level.

Keep chipping tools sharp and well cut out.

Use a chip paddle which covers tins and cup.

Cut an advance streak not later than February 1.

Keep shoulder lines straight.

BACK FACES—U. S. F. S. places a second face when a 4 inch and an 8 inch bar can be maintained. A third face may be cut if 4 inch bars are maintained.

The rest period depends upon growth rate, number of faces planned and ultimate size of tree desired when the last face is completed. Ordinarily this will be 4 to 10 years if 3 faces are desired and a 16 inch tree is wanted after it is worked out for turpentine.

Two faces shall not be worked concurrently.

RAISING—Raise preferably yearly depending on economic conditions.

Tack in streaks (or)

Restrict incisions to 1-4 inch radial depth (or)

Drive tins in jump peaks.

SUPERVISION—Close supervision plus

a bonus for superior work is essential. Inspect periodically and rate the work of woods riders for comparison. Keep records of production and costs per crop.

SCRAPING—Avoid slabbing wood from faces. Punch scrape at each dipping is probably good practice. Use winged scrape box for low faces and push up bucket for high faces.

DIPPING—Dip at least every 4 streaks.

Where possible dip on 2 streaks. A wood dip paddle is recommended for zinc, aluminum and painted cups.

RADIO UTILIZED FOR FIRE CONTROL ON GEORGIA FOREST

The Superior Pine Products Company, with headquarters for its 200,000 acre Suwanee forest at Fargo in Echols county, has adopted the radio system of communication in forest fire control.

From a broadcasting tower at Fargo, contact is made with forest patrolmen who carry radio communication sets. Very quick communication is thus provided and quick concentration of fire fighting crews at points of fire outbreaks are made possible.

Radio adaptation to forest patrol work is a recent development and the Superior Pine Products Company is to be congratulated on its progressiveness in adopting the method.

EDUCATIONAL OBJECTIVES OF WORK WITH CCC'S

In a handbook for educational advisers in the Civilian Conservation Corps camps, issued by the office of education of the United States Department of Interior, the following statement of the "Dominant Aims of the Educational Activities" is given:

"Building wherever possible upon the activities already under way, the aims of the strengthened and broadened educational program are:

1. To develop in each man his powers of self-expression, self-entertainment and self-culture.

2. To develop pride and satisfaction in cooperative endeavor.

3. To develop, as far as practicable, an understanding of the prevailing social and economic conditions, to the end that each man may cooperate intelligently in improving these conditions.

4. To preserve and strengthen good habits of health and of mental development.

5. By such vocational training as is feasible, but particularly by vocational counseling and adjustment activities, to assist each man to better meet his employment problems when he leaves camp.

6. To develop an appreciation of nature and country life."

"A man has no natural right to inherit good land and pass on a waste of gullied hillsides to those who come after him. We are not complete owners of the soil, but only trustees for a generation."—Arthur E. Morgan.

PROGRESS OF FOREST SURVEY IN NAVAL STORES BELT

The forest survey conducted by the United States Forest Service in the south is directed by Capt. I. F. Eldredge with headquarters at the Southern Forest Experiment Station at New Orleans. Capt. Eldredge was formerly manager of the Superior Pine Products Company with headquarters at Fargo, Georgia.

The following, from "Southern Forestry Notes", issued monthly by the Southern Forest Experiment Station, tells of the progress of the work:

The allotment of funds from various emergency organizations of the government has made possible a large increase in the number of crews working on the Forest Survey. At present there are 16 crews in the field. These crews are covering a total of nearly 220 miles of line a week. In spite of this seemingly huge weekly area covered, there is many years' work ahead before the long job for the whole South is done.

At the present time, following completion of most of Louisiana Unit No. 1 (the bottomlands west of the Mississippi and north of the Red river) of 5,000,000 acres, work is being concentrated in the naval stores belt in the Southeast, and on a special job on the Clinch river watershed in the Tennessee Valley. There are now 13 crews in the Southeast, and 3 in the Tennessee Valley.

At this rate it will take about five months to complete field work on the naval stores units of S. E. Georgia, N. Florida, and S. W. South Carolina. It is hoped to obtain additional funds to complete the whole 46,000,000 acres of the primary naval stores belt within 8 months.

The completion of the Survey in this important region of the south is of vital importance to the naval stores and other forest industries, since the data obtained by the survey as to trees available for working, present requirements, drain, yield, replacement, forest practices, etc., will be the basis for many of the regulatory provisions of the Control Board of the industry under which each naval stores producer or stiller must operate, and will give the fundamental data for long time plans for the several industries interested.

Lookout Mountain Now National Park

Lookout Mountain, close to Chattanooga, has become a part of the Chickamauga-Chattanooga National Park. The added area is 3,000 acres already developed by private interests headed by Adolph Ochs, publisher of the New York Times, and former resident of Chattanooga. This valuable addition to national parks was donated and accepted by the National Park Service the first of this year.

FORESTRY QUESTION BOX

Do dead forest trees do any harm to the living trees?

They harbor injurious insects and diseases; increase the fire hazard, and when blown over by storms, they damage living trees. If there is no local market for the dead wood on the farm for fuel or lumber, and the cutting of such timber is a dead expense, the felling of the dead trees is beneficial enough to the forest to merit the cost.

Does a farmer who cuts or hires the cutting of his own trees to produce lumber for use on his own farm, have to obtain permission from lumber code authorities?

No, not as long as the products are used on the farm, but if any timber is cut for sale, or the products enter the market, then permission must be obtained from code authorities.

What is the latest date I can cut timber without running the risk of an outbreak of the southern pine beetle?

In the southern part of the state, cut before March; in the northern part of the state, not later than March 15. It would be safer if the last cutting dates were two weeks earlier than those mentioned. It is the odor of fresh cut wood that attracts pine beetles, and as soon as they become active in the spring, they will flock to where fresh cut wood is found.

What insect has damaged the pine twigs? (Specimens of infected twigs submitted)

The State Bureau of Entomology identifies the damage as that caused by the tip moth. The insect lays eggs in the growing buds. The larvae, or worms, hatched out feed on the tips of the pine shoots and destroy them. Aside from retarding growth and modifying the developments of the branches, no other harm results from attacks of tip moths.

Does pruning young pines make them grow faster?

If not pruned too heavily the trees make more rapid height growth, but the diameter growth is likely to be slowed down by pruning until the crown makes up for the lost limbs with their foliage. Tree growth is most rapid where there are the most leaves.

Will heavy grazing check the growth of planted pines?

Evidence indicates that on moist lands, where carpet grass is luxuriant and where livestock graze heavily, the tramping of the cattle injures the feeding roots of pines and retards growth more than on sloping lands where the soil is not so soft and grazing is

poorer. Instances, however, are of record where grazing slash pine lands on well drained soils has shown greater tree growth than on an adjoining area ungrazed. The explanation apparently is that the grazing reduced competition of the trees with grasses for the supply of moisture, and possibly for plant food.

CHECK DAMS FOR GULLIES ENGINEERS' SPECIFICATIONS

Erosion control is receiving more attention under the impetus given by the present federal administration to forest and soil conservation, than ever before. A number of Civilian Conservation Corps are giving their entire time to erosion control where land is badly gullied.

How to dam the gullies so that they will fill up and at the same time control water flow so that no gullies will be made in the future, is not as simple a matter as many people think. According to the agricultural engineers of the U. S. Department of Agriculture, the dams should be lower in the middle so that water will not cut away the earth at the sides, make new channels and destroy the effectiveness of the dam. Nor should the dams be too high, according to these authorities, else the water will overflow the sides of the gullies and around the ends of the dam and start new gullies.

It is also advised that the ends of the dams extend into the banks far enough to prevent water seeping around and starting washing around the ends of the dam.

PUERTO RICO'S TIMBER PRODUCT SUPPLIES SCANT

In Puerto Rico the population is 440 to the square mile, or more than 10 times the average in continental United States.

Timber products are at a premium in that territory, according to the United States Forest Service.

Charcoal is the principal, or almost the only fuel. It is made from small trees cut from the island's depleted forests. Construction timber comes from the Pacific northwest.

Trees grow rapidly in Puerto Rico. A plantation of Australian pine 10 years old has grown as much as 57 feet high and is estimated to contain a volume of 32.2 standard cords of wood per acre. Mahogany, cedar, and other trees are expected by the Forest Service to yield timber crops in 30-year rotations, and some "fast-growing species" are said to produce cordwood at the rate of 5 cords per acre per year in a 5 year rotation.

The Loquillo National Forest is under taking to help meet the great needs of the island for timber products.

SECOND DISTRICT**E. B. Stone, Jr., Dist. Forester
Gainesville****E. C. W. ITEMS****Camp SP-1, Indian Springs**

The most important project of the month has been the entrance bridge at the south entrance of the park. The new bridge now under construction is of reinforced concrete, stone veneered, an elliptical arch of 77 foot span, over Opothoholo creek just above the old mill. The Museum Building will be completed within and without by the end of the month and is one of the most attractive buildings to be found anywhere in the State.



New Museum building at Indian Springs erected by CCC men.

Camp SP-2, Vogel Park

Work is being pushed with all possible speed on completion of the new stone veneer tea room and it is planned to have this structure completed by April 1st. We also have under construction several smaller structures in various parts of the park which will be completed during the current month. The lake site for the proposed dam project has been cleared and plans are all ready to begin construction of the dam itself as soon as the new work period opens. This dam across Wolf creek about 3 miles north of Neel Gap will form a lake covering approximately 30 acres and will greatly add to the attractiveness of this unusually interesting part of the north Georgia mountains.

Camp P-73, Towns County

Several new truck trails are now under construction and all roads previously constructed are being maintained so as to put them in first class condition for use during the summer months. There are also several foot trails under way and a thorough job of erecting proper direction signs on both the truck and foot trails is nearing completion. The construction of these truck and foot trails has made accessible areas which were formerly absolutely inaccessible by any method of transportation other

than on foot. This camp has suppressed a number of forest fires and is ready at all times to render assistance in controlling any fire that occurs in their zone of operations.

Camp P-79, Cornelia

This camp is busy with the completion of 2 fire lookout towers which will form an important part of the fire protection system being built up in Habersham, White, Hall, Rabun, and Banks counties. Work is being rushed on completion of truck and foot trails now under construction and all other projects. A thorough system of signs has been erected on all truck and foot trails which have been constructed. This camp has also assisted in the suppression of forest fires in their section as needed.

Camp P-69, Commerce

This camp is carrying on at an increasingly active pace in an effort to complete all projects now under way by April 1st, which is the end of the second 6 months' work period. A large number of miles of truck trails, foot trails, have been constructed together with 2 forest lookout towers. The telephone lines, and towers, are for use in fire control work which is planned to cover all or part of the following counties: Banks, Jackson, Hall, Madison and Clark. We feel that this camp has done an excellent job in completing the projects as undertaken and its activities will result in much better fire protection over a large area.

THIRD DISTRICT**C. N. Elliott, District Forester
Augusta****Tree Plantings in Hart County**

Hart county has carried on an aggressive pine planting program and as a result 113,000 loblolly pines purchased from the state nursery at Albany, were set on 49 farms. More would have been planted had more seedlings been available.

Much credit is due County Agent West-

brook for stirring up interest, rounding up orders and assistance in planting.

Hart county is thickly settled and is not applying the fuel needs of farms from existing forests, not to mention farm needs for lumber, fence posts, etc. It is not unusual to see coal piles at farm houses. The county has considerable abandoned and eroded land not suited to agricultural crops which should be growing timber. The sentiment in favor of increasing the timberlands in Hart county is growing, and one can expect that the high class and progressive citizenry of that county will solve its forestry problems.

Transplanting Cedars

For plantings on the Nixon state forest in Richmond county, the district forester through the cooperation of E. H. Thomas vocational agricultural teacher of Nancy Hart Consolidated School in Hart county, obtained 5,000 cedar seedlings. The cedars were taken from an area under natural reforestation.

State Forest Inspection Planned

Those who attend the annual meeting of the Georgia Forest Association in Augusta during May, will be afforded an opportunity to visit and inspect the Gwinn Nixon State Forest, where progress in forest improvement, planting, protection and land drainage will be seen, and plans for the future explained.

FOURTH DISTRICT**W. G. Wallace, District Forester
Columbus****Work Finished Warm Springs —
ECW Camp Abandoned**

During the past nine months the CCC camp at Warm Springs has completed practically all of the originally planned project, which it was estimated would take at least twelve months to finish. Excellent work has been done by these sturdy young men and they may well be proud of what their labors have accomplished.

The work project under Superintendent Lamar Flowers is an outstanding memorial to the leadership of Mr. Flowers and his corps of technicians and foremen. Capt. Russell B. Reynolds has aided and conscientiously guided the CCC personnel, as camp commander, throughout the entire duration of the camp, and has always shown a deep interest in the welfare of his men and camp.

The combination of good fellowship and personal interest which has been manifested by the entire personnel has resulted in the construction of a system of firebreaks, truck trails, towers and telephone lines that will enable the land owners of over 50,000 acres of forest land in the Pine mountain TPO, to efficiently protect their timberlands from fire.

Your district forester is anxious to see if these land owners realize what a truly

great service has been done for them, and if they are going to show their appreciation.

Taylor-Talbot TPO Reorganizes

A splendid meeting of the members of the Taylor-Talbot TPO was held in the courthouse at Butler recently for the purpose of electing new officers and learning more about the benefits and work of the organization. The following new officers were elected: W. J. Butler, president; T. J. Fountain, vice president; G. C. Daniel, secretary-treasurer.

Very good results have been accomplished by this organization in fire protection and it is to be expected that much better results will be obtained in the future due to greatly increased interest and construction of adequate primary firebreaks by the local CCC camp.

The Butler CCC camp has been retained for the third period in order to finish the system of firebreaks and towers originally planned.

SIXTH DISTRICT

Jack Thurmond, Dist. Forester
Savannah

No Raking Turpentine Trees

The Soperton Naval Stores company, which has some 14,000 acres of timberland under fire protection in the Treutlen county timber protective organization, does not rake around and burn off the woods in turpentine operations. Mr. Jim L. Gillis, who is manager of the company, has been actively engaged in protecting his timberland from fire since 1929 and has attained good results and especially in growing young turpentine timber. Mr. Gillis does not rake his trees and says that by not raking and burning he gets at least one-third more gum and a better grade of rosin.

Fire protection, as administered by the Georgia Forest Service costs about 5 cents per acre per year in the Treutlen T. P. O., of which Mr. Gillis is a member, and if he raked his timber that he is working for turpentine, it would cost 20 cents per acre per year and he would receive one-third less gum and a lower grade of rosin, to say nothing of the damage to his young timber, if allowed to burn. Mr. Gillis finds that it is most profitable for him not to rake and burn his timber in turpentering; and since he has been following the above practice for the past three years, has greatly reduced his operating costs and increased his production without cupping any increased acreage.

E. C. W. News

The members of Camp P-53, Liberty county, have just completed a 50 foot bridge across Bird branch which has opened up some 25,000 acres of T. P. O. lands for fire fighting. They used a homemade pile driver for putting in the piling and

used CCC boys for motive power in operating the driver.

The pile driver proved successful and is a real asset in bridge construction work.

Type Mapping

Since ECW work started last summer, 600,000 acres of timber type mapping has been completed in the Savannah district. Timber type maps are most essential in fire protection, forest management and naval stores operations, for they not only show timber types, but topography as well, which is very essential in that it gives a good general idea of what is available in combatting forest fires, such as open fields, streams and roads. Treutlen county has been completely mapped and contains 165,000 acres of land.

Turn Out the Company

Recently, a lookout stationed in tower No. 3, Long county T. P. O., called the camp and stated that it would be necessary to turn out the whole camp, including cooks and K. Ps., as the world seemed to be on fire. On investigating the call, the camp superintendent found that the lookout had mistaken the moon rising over the flatwoods for a monster forest fire.

SEVENTH DISTRICT

C. Bernard Beale, Dist. Forester
Waycross

The Okefenokee T. P. O. in southern Ware county is merging with the already vast area of the Consolidated T. P. O. of Clinch, Lanier, Atkinson and Ware counties. The Consolidated T. P. O. will now consist of some 440,000 acres, reaching from Lakeland east to Waycross, and from the Okefenokee swamp north to the great Satilla river. They are employing Mr. J. O. Rodgers, Homerville, as full-time secretary-treasurer, and have ten 100 ft. steel lookout towers in the area, all connected by T. P. O. telephone lines. Mr. Rodgers is constantly on the job signing up additional acreage and collecting assessments. He is a frequent and welcome caller in the district office.

The Camden County T. P. O. is offering a reward of \$100.00 to any person causing the arrest and conviction of anyone setting fire to any of the T. P. O. lands, and Secretary-Treasurer Karl Meschke, of the Georgia Forest Products Company, has had 1,000 signs printed to be posted throughout the protected area telling the world of this fact. Less than 1 per cent of the protected land in Camden county has burned this season.

This office has a heavy demand for T. P. O. individual contract forms, especially from those areas employing full time secretaries. J. T. Clark, formerly camp superintendent of P-68, abandoned camp at Douglas, is wide awake on the job as secretary of the Coffee-Jeff Davis T. P. O. He

has worked up some real interest in those two counties, and reports frequent and lively meetings of the board of directors. He has already signed up an additional 20,000 acres to the existing 140,000 acres of that T. P. O.

The T. P. O. is sawing lumber in Appling county to construct two 100 foot lookout towers. These towers will be the patented split ring type, designed for the forest service by the Timber Engineering Company of Washington, D. C., who have loaned us plans and specifications for same.

E. C. W. Items

Superintendent Dyal, P-60, Colesburg, has completed laying submarine cable across Cumberland river to Cumberland island, and shortly the island will for the first time have telephone connections. The Carnegie estate, which owns the island, has loaned the camp a boat until the line is completed. They are served by the tower, now at Hermitage, which will be moved this summer to Cabin Bluff on Cumberland river.

With spring drawing near, the fire season will soon be over, and no one is prouder of this fact than the CCC boys and their foremen. They have made a gallant showing this winter and rightly deserve the praise which landowners have given them. Few realize just how bad it is to be warmly tucked in bed and hear the fire whistle pierce the dark hour of midnight, and have to crawl on a truck to ride 20 miles in the cold—but not one ever failed to answer the call—even with some enthusiasm.

RULES FOR IMPROVING PINE HARDWOOD FORESTS GIVEN

For guidance of CCC workers in forest improvement, the Southern Forest Experiment Station issued a bulletin in which measures for handling shortleaf-loblolly hardwood forests are given. Species to be favored are shortleaf and loblolly pine, red and white oaks and redgum.

"The best trees", says the bulletin "should be selected as crop trees, even if this makes the spacing a bit short or long in some instances."

A table is given showing spacing for different sized trees as follows:

Average diameter Breast high— all trees	Distance between trees	Trees per 1-10 acres
Inches	Feet	Number
4	8	68
6	10	44
8	12	30
10	15	20

The distance between trees is approximately the average distance between the crop tree and its 3 nearest neighbors.

While thinning is the main improvement measure, the treatment should include removal of inferior species, the crooked or defective specimens of desirable species.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

SCOUTING FOR MINERALS FOR THE T. V. A.

By J. S. LEWIS, Jr.

Since my appointment as geologist for the T. V. A. I have been repeatedly asked the following questions: "What is the T. V. A., and why is it interested in the mineral deposits of North Georgia?"

The writer is not here concerned with giving a detailed answer to the first question. He will leave that to those whose store of information is more abundant and whose gift for setting down details is much greater. Suffice it to say that the Tennessee Valley Authority is an organization created by Congress for the purpose of supervising and conducting the development of the Tennessee Valley area. It is interested not merely in building several huge hydro-electric power plants but in the complete social, agricultural, and economic development of the valley area.

The second question is much more easily answered. As stated above, the T. V. A. is interested in the economic development of the area. This development includes the bringing of new industries into the valley. Cheap power will be available for the hydroelectric plants and much of the labor now used rather ineffectively in agriculture could be employed in manufacturing, etc. Naturally enough, the capitalists in all parts of the country who may be considering a project in the area are interested in knowing just what natural resources are available not only in the area but in the surrounding territory close enough to be drawn upon. Therefore, the T. V. A. is interested in finding out what commercial minerals exist in north Georgia, and the quantity, availability, and previous and present development of these minerals.

C. W. A funds appropriated to the T. V. A. made possible the launching by them of two surveys to be conducted in Georgia: a general economic survey and a mineral survey of north Georgia. The writer was fortunate enough to be appointed along with A. B. Johnson and W. C. Hansard to conduct the mineral survey.

Our appointment began on the 18th of December, although the actual field work did not start until January 3. The work was under the supervision of Doctor E. C. Sekel, geologist for the T. V. A., and Richard W. Smith, Georgia State Geologist. The localities visited were at their suggestion.

The time and equipment available for the investigation did not warrant prospect-

ing for new mineral deposits. Our instructions were to locate in a central town in each county and go out with the various property owners who knew, or thought they knew, that they had mineral deposits. We were to obtain as much information about each deposit as possible, including its location with regard to known points, its proximity to railroads and other roads, the condition of these roads, the size of the deposit, its mining conditions, and its previous development. This information, together with samples of the material, was to be sent to the headquarters of the T. V. A.

The survey included Bartow, Cherokee, Pickens, Towns, Floyd, Haralson, Walker, Catoosa, and Chatooga counties. The time available in each county permitted only a few of the deposits to be visited. Indeed, the investigation hardly scratched the surface.

As is usual in an investigation of this kind, much time was wasted in visiting properties reputed to contain mineral deposits but which proved to contain little, if anything, of value.

From the above listing of the information to be gathered, together with the fact that no prospecting was done, it might seem that an investigation of this kind would be very monotonous. Such is far from the case. Perhaps a description of a typical day might not be amiss:

Mr. Brown, having seen in a county newspaper that we are investigating minerals, calls and makes an appointment for us to go with him to look over his property on High Ridge mountain, which contains valuable minerals. Accordingly, we arise next morning, and find that Mr. Brown's breakfast has preceded ours by several hours and that he is ready to leave. Assuring him that we can't climb mountains very well on empty stomachs, we have breakfast and then start out. After a fifteen mile ride over mountain roads we leave our car and are seen climbing the mountain. The air is peppy and the first two miles are not difficult. Mr. Brown has about 150 acres, so the morning is used in sampling and taking notes on the various outcrops. Then we return to town for lunch and a similar trip takes place with Mr. Jones in the afternoon. Mr. Brown and Mr. Jones are both excellent companions and the conversation is interesting if the climb is not too steep for talking. Boy, but supper tastes good after such a trip. Of course I omitted the day it rained and we got stuck and didn't reach the deposit at all.

Work of this kind affords an excellent opportunity to study the characteristics of the people who live in the northern part of

our State, as well as a chance to become familiar with the natural beauty of this section. It is surprising to note the difference in the people as well as in the scenery as we pass across from Walker county in the Appalachian valley in the northwest corner of the state to Towns county in the center of the Appalachian mountains near the northwest corner. Many quaint and interesting characters are encountered, and their view of life, usually very freely given, are interesting and often amusing as well as informative. Observation of some of these characters gives one a slant on life that can't be obtained in a city or even from books.

Various attitudes with regard to the investigation are also encountered. We find one property owner who has a mineral deposit and who is sure that we are going to pay him a fabulous sum just as soon as we see the deposit; it takes quite a bit of explanation to convince him that we aren't buying anything. The very word "mineral" seems to convey the idea of large sums of money. Many of these people do not stop to consider that often the cost of operating a mine would far exceed the value of the deposit, even though the mineral itself might be valuable. Then we encounter the property owner who has "indications" of a mineral occurrence. Nothing of any consequence is visible, but an old miner has told him that he has such and such a mineral on his property. Much time can be wasted here. We also find the secretive type. He is sure that he has a deposit of value and if he isn't careful he will be cheated.

From the above it might be construed that I mean to cast a reflection on the intelligence of these people. Nothing could be further from the truth. They are for the most part pure American and their intelligence is of high order, even where education is lacking.

North Georgia's importance in the mineral world is as yet undetermined. The minerals are present; of this there can be no doubt. The main difficulty lies in their inaccessibility. The deposits are scattered and their development handicapped by the fact that most of them are located in districts where transportation is very poorly developed.

Of the counties visited during this investigation only two contain active mineral operations on anything approaching a large scale. These are Bartow and Walker counties. Ocher, manganese, and barytes are being mined in Bartow county, and one company is producing lime and cement from dolomite. There is one fairly large coal operation at Durham, Georgia, Walker county. One of the barytes operations, at Cartersville is said to be the largest in the world. Before and during the World War, iron was mined in Bartow county on a large scale. Some of the old cuts are gigantic in size, and the old furnaces are still standing.

Of the mineral deposits visited those

which hold the most promise, in the opinion of the writer, of future development are sericite, chromite, tripili, quartz, chlorite schist, shale, iron ore, manganese, barytes, coal, vermiculite, mica, bauxite, and feldspar. Other deposits seen, although small, include beryl, tourmaline, amethyst, bentonite, diorite, agate, jasper, and primary kaolin.

A reduction in the personnel of the C. W. A. projects under T. V. A. forced the termination on March 1 of the appointment of Mr. Johnson and the writer. Mr. Hansard is still carrying on the investigation which will continue until April 1 or later.

DEVELOPER OF GEORGIA CLAYS DIES

David Raymond Edgar, pioneer in the development of the clay industry in Georgia, died February 28 at his home at Metuchin, New Jersey. He was 51 years old, a graduate of Rutgers in 1903. Immediately following his graduation he became associated with his uncle Charles S. Edgar, founder of the Edgar Companies, and spent several years in Georgia and Florida, devoting his activities to mining, refining and shipment of clays.

Following the death of his uncle, he became president of the Edgar Companies. Under his capable direction the industry grew to large proportions and much has been achieved by him in promoting the use of Georgia and Florida clays in ceramic, paper and other industries.

CCC MUSIC RESTRICTIONS

Civilian conservation musicians can do their stuff only for the boys in camps. This is not by vote of CCC men, but a decree of the Chief of the Staff of the United States Army who puts the forest and park corps musicians under the same regulations as army bands.

Civilian musicians are to have freedom from CCC competition. The populace is, however, not denied the privilege of hovering around the camp and absorbing harmony intended for home consumption.

CONSISTENCY OF BUTTERMILK

How big words fail to get across is told concerning a Georgia farmer who heard a forester explain in detail how to plant tree seedlings. Among the instructions was one to the effect that the young trees be put in a bucket containing a clay and water mixture of the consistency of thick buttermilk. Only the buttermilk part of the statement got across to the farmer. Instead of placing his seedlings in a mud mixture, he put them in buttermilk. The seedlings did not object, for they all lived when planted.

SPECIAL MINERAL SURVEY BEGUN IN GEORGIA

U. S. Geological Survey Starts Investigation of Gold, Vermiculite and Hyanite

Work started the last week in March on the investigation of the gold and other mineral resources of Georgia by the U. S. Geological Survey under Public Works Funds, according to State Geologist Richard W. Smith. The investigation of gold and related minerals is in charge of Dr. Roy A. Wilson, a graduate of the University of Montana and the University of Chicago and a geologist of world-wide experience. Dr. Wilson will be assisted by Mr. Carey Hansard of Atlanta, a graduate of the Georgia School of Technology.

Dr. Wilson and Mr. Hansard will first visit every gold property in Georgia on which mining or prospecting work is in progress. The characteristics and method of occurrence of the gold veins, as exposed by these workings, will be studied. After this, as far as funds are available, the geologists will visit and examine such undeveloped gold properties as will give them the most information as to the future of gold mining in Georgia.

Arrangements were made by Mr. Smith during a recent consultation with government officials in Washington to extend the work to include an investigation of the kyanite and vermiculite deposits of Georgia. Kyanite is a mineral much in demand recently for use with clay in the manufacture of high-heat duty fire brick. Vermiculite is a bronze colored micaceous mineral that swells on heating to a light fluffy material used as a heat insulator and in the manufacture of acoustical wall board. Deposits of these two minerals are known to occur in Georgia and the present investigation is primarily to determine their extent and value.

Mr. Smith states that work on the bauxite and bleaching clay deposits will not start until late summer, when parties will begin examining the fullers earth deposits of south and middle Georgia and the bauxite deposits of middle and south Georgia.

BEAR IN DRIVER'S SEAT

A bear cub is growing up in Yellowstone National Park that should make a good taxi driver of the horn-blasting variety, according to the U. S. Department of the Interior.

Forest rangers investigating the cause of a deafening motor-horn solo in the vicinity of one of the hotels in the park, found the driver's seat of an automobile occupied by a cub that was getting all he could out of the horn. "Even his mother seemed impressed by his performance," said the Ranger. Service Letter (Pa.).

EXAMINATIONS TO BE HELD FOR CAMP SCHOLARSHIPS

The annual forestry examination to determine who will obtain scholarships that cover expenses at the vocational forestry camp, will be held the latter part of April, the dates to be announced to the vocational agricultural teachers later.

One scholarship goes to each county having vocational agricultural schools.

PAUL BUNYAN OUTBREAK

Here is a mosquito tale from a CCC worker of Oregon:

"The mosquitoes in camp atop Pine mountain are so big we use hog wire for mosquito netting. Some of 'em even carried blackjacks. And say, the Mess Sarge had to bribe 'em with pork chops so he could sleep nights. One morning just as one of the boys was starting to work, a big grey-headed mosquito made a pass at him, but he was quick enough to jump behind a big pine tree. The mosquito, angered at this move, drove his bill through the tree but our hero bradded his bill with the back of his ax and left him kicking as he continued on to his work. That afternoon as our hero returned he found that the mosquito had kicked out 326 building rafters and gone. P. S.—The rafters were used to build barrack buildings down here in our new camp."

The United States Department of Agriculture announces that ethylene gas can be used to remove "stick tight" walnut hulls at a cost of 6 to 8 cents a ton.

"You have been in this telephone booth half an hour with the receiver in your hand and you haven't spoken a word."

"I know. I am talking to my wife." — Southern Lumber Journal.

"That dentist wasn't painless."

"Why, did he hurt you?"

"No, but he yelled when I bit his finger."

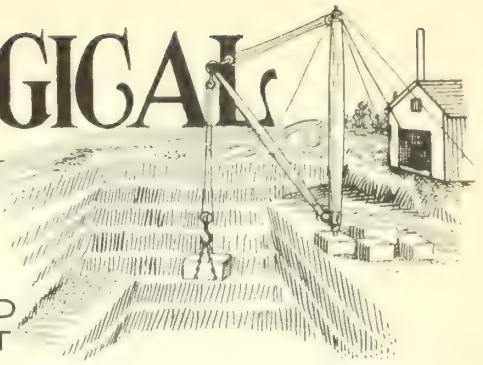
He—"I like your form".

She—"Do we have to go over all that again?"

"Let us play fair with our grandchildren. Let us leave them forests which they can use for timber, for play grounds, or merely for scenery, as they may choose."—F. A. Silcox, Chief Forester, U. S. Forest Service.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



Vol. 4

ATLANTA, GA., MAY, 1934

No. 5

NEW STATE PARK—DONATION OF CATOR WOOLFORD— HISTORIC COASTAL AREA WITH SPANISH MISSION RUINS

To be Known as San Domingo Park, Commemorating Heroism and Achievement of a Hundred Years of the Earliest History of Georgia—Old Spanish Mission to be Restored and Area to be Converted into one of the Most Beautiful Parks in Eastern United States—CCC Men to Begin Work at Once

The State of Georgia is indebted to Cator Woolford, Atlanta, for a 300-acre state park located on the Altamaha river, near its mouth. The generous gift of Mr. Woolford is a part of his extensive plantation, and includes the ruins of an old Spanish mission and fortress, erected about the year 1600, and the ruins of buildings of a typical coastal plantation occupied in the early days by landed aristocracy of Georgia.

The new state park is named the San Domingo Park after the San Domingo Mission. It is near the Coastal Plain highway and, therefore, easily accessible not only to Georgians, but to the great number of tourists who annually flock to the Georgia

coast and Florida. It is the first state park to be established on the Georgia coast, and one of the main objectives sought is to stimulate greater interest in the 100 years of the earliest and much neglected history of Georgia.

Commission Accepts Gift with Gratitude

At its last meeting the Commission of Forestry and Geological Development accepted Mr. Woolford's gift and authorized its secretary, State Forester B. M. Lufburrow, to convey its sincere and deep appreciation. A copy of the letter conveying this expression of appreciation is as follows:

(Continued on Page 2, Col. 1)

PROGRAM GEORGIA FORESTRY ASSOCIATION ANNUAL MEET

Augusta Host—Program of Unusual Interest May 10 and 11 — State-wide Attendance Urged for Formulating Forestry Development Program in Line with New Deal

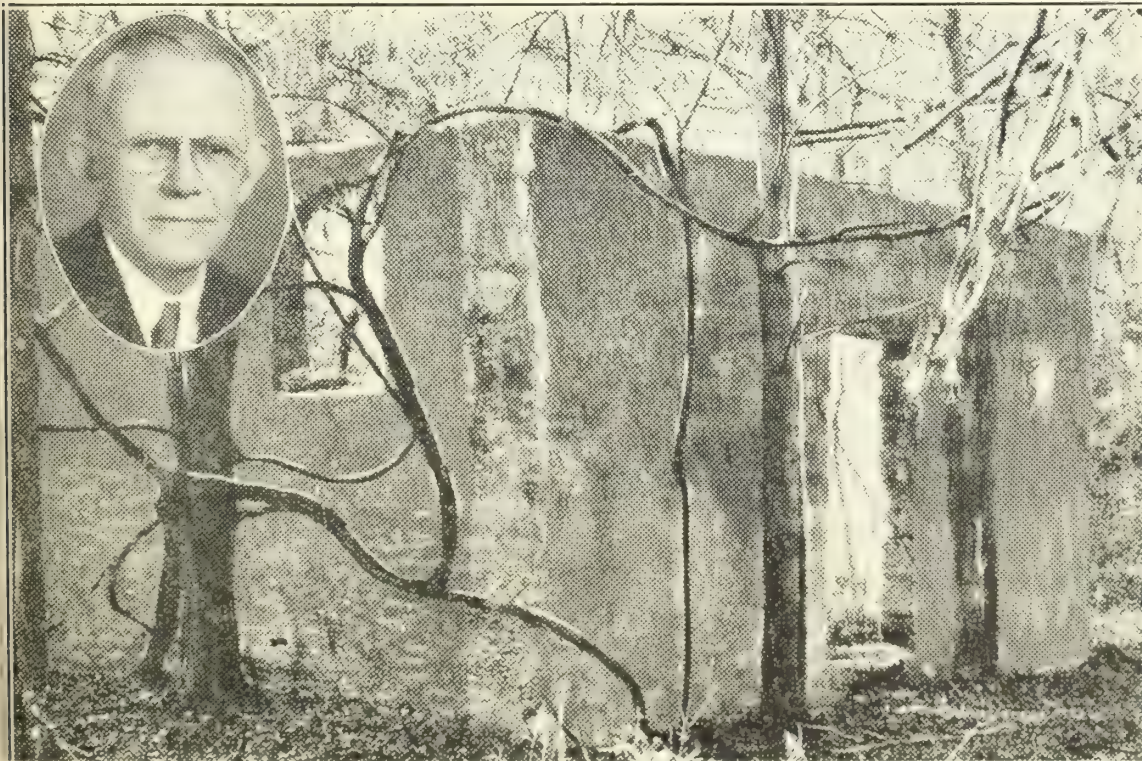
The thirteenth annual meeting of the Georgia Forestry Association will be held at Augusta May 10 and 11. In many respects the meeting is expected to be outstanding. A list of speakers unexcelled by any previous program, the unusual interest created in forestry by CCC work, lumber code, new state parks, enlarged areas of timber protective organizations—these and other developments linked with the "New Deal" forestry is now receiving, make the Augusta meeting one of unusual import.

Forestry is moving forward rapidly in Georgia and it is important that there should be state-wide attendance at the Augusta meeting so that a program for forestry development may be promoted in every county.

The Georgia Forestry Association, composed of public spirited citizens, not only developed public sentiment and legislation that created the Georgia Forest Service, but has zealously fostered and promoted every important forestry activity in the State. Those who want the forest resources of their state developed can do no better thing than to attend the Augusta meeting and join hands with the association in carrying out its program.

Among the noted men to address the meeting are Robert Fechner, Washington, head of CCC work of the nation; Capt. I. F. Eldredge, New Orleans, head of the fed-

(Cont. on Page 3, Col. 1)



Views of Ruins San Domingo Mission—Inset, Cator Woolford, Donor of 300-acre Park

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SAN DOMINGO PARK

(Continued from Page 1)

"As secretary to the commission of forestry and geological development, and in behalf of the commission, it is with great pleasure and a deep sense of gratitude that your magnificent gift of San Domingo mission to the state of Georgia as a state park is hereby acknowledged.

"The patriotic and unselfish service you have thus rendered will further endear your name to thousands of Georgians and to posterity.

"You have by your gift not only contributed to the pleasure of a vast number of people far and near who will visit the park, but you will have revived interest in the early history of the courageous pioneers of the south Atlantic coast whose memory has been neglected as much as the missions and forts they left.

"The area which you have donated promises to be one of the most beautiful and interesting in the entire country when the plans for its improvement have been completed and the state of Georgia will be everlastingly indebted to you for it."

The gift of Mr. Woolford is only one of his generous contributions, among them being his gift to the Georgia Building at Warm Springs and to public relief work.

Historic Setting

The first Spanish settlement in Georgia was made by General Mendez at St. Catherine island in 1566. Other settlements and

missions were established in rapid succession on island and the mainland. The region was named Guale and designated a province of Florida, the name being that of a friendly Indian chief on St. Catherine island. Just how much territory was embraced in the Guale province is not well defined.

General Mendez brought three Jesuit priests to Guale in 1568. Among them was Domingo Augustin, a noted missionary who had rendered valuable service in Mexico, particularly in translating the Catechism into native languages. One of the first things he did was to translate the Catechism into the Yamassee language, the first publication issued in this country. Domingo died within a year and other Jesuits were so harrassed by the Indians that they left for Virginia and Gulf points. Whether the Jesuits conducted a mission at the Talaxe settlement, the site of San Domingo park, is not certain, though some writers seem to think they did.

The Jesuits were succeeded by the Franciscans in 1595, and records show that they made rapid progress in establishing missions on St. Catherine, St. Simon, Jekyl island, Sapelo island, and on the mainland at Espochoche, Tolmato, Tupiqui and probably Talaxe. Then came an uprising of Indians in 1597 and the wiping out of the missions. The Talaxe Indians had a part in the uprising, and were punished by Governor Canzo, of Florida. Their crops were destroyed along with those of other rebellious tribes, but the Indians themselves escaped death by fleeing into the swamps.

In 1601 the Indians sued for peace and asked for missionaries. Early in 1606 the friars came again to Guale. Among them was Fray Diego Delgado, who was stationed at Talaxe, and also ministered to Indians at Espochoche and St. Simon. Thus Talaxe, the site of the San Domingo mission came into prominence as a missionary center.

In the same year came the bishop of Cuba, who had jurisdiction over Spanish missions in Florida and the coast as far as Port Royal, S. C. Thousands of Indians were confirmed by the bishop, and among the tribes visited was the one at Talaxe.

A list of missions in 1633 mentions "San-to Domingo de Talaxe." In 1675 Father San de Useda is reported in charge at San Domingo de Talaxe. Available records fail to disclose the names of other friars who served at San Domingo. In 1680 open warfare by Indians, led by the English, started the slow and stubborn retreat of the Spanish from the Georgia coast. Spanish power in eastern United States ceased in 1819, when Florida was ceded to the United States.

Tabby Construction

In 1577 Governor Pedro Menedez Marques discovered that lime could be obtained by burning oyster shells, and coquina was discovered on Antosia island, near St. Augustine, in 1580. These important discoveries led to the use of coquina in construct-

ing missions and forts. At first the mission buildings and fortresses were made of wood, so there are no remains of the earliest Spanish structures. The remains of structures now found on the coast are of later tabby construction, probably erected between 1606 and 1610.

Close by each mission a fortress was erected. It was the plan of Spanish settlers to locate missions and fortresses a day's journey apart, so that travelers could find shelter and protection for the night. The fortress was usually an octagon-shaped structure and as coquina came into use, they were made of that durable material. An authority states that the military and the missions were distinct organizations, often at variance with each other.

In some instances plantation owners along the coast who had acquired estates on which mission buildings and forts had been erected, found the fortresses suitable structures in which to grind cane and make sugar. As a consequence, some of them were named "sugar houses", but apparently the fortress at San Domingo park was not used for sugar making, because the remains of a sugar house with its chimneys stand nearby.

San Domingo mission was the last mission in Georgia to be given up by the Spaniards. Others on islands were more accessible to ships and soldiers. San Domingo was hidden away and less vulnerable.

Beautification Plans

The ruins of the mission and fortress at San Domingo park are surrounded with a variety of vegetation. Clearing out the undesirable undergrowth, constructing a road, paths, bridges, will be among the first activities, according to the Georgia Forest service. Mrs. M. E. Judd, member of the commission of forestry and geological development of the state, and park authority has in mind making the fullest use of the natural vegetation of the area in developing the park.

The vegetation of the area is typical of the coast. A great variety of trees and shrubs are found. Gray moss draping the trees will add to the scenic beauty. A canal once used to flood rice fields will be put in order, as well as a portion of the old rice field in the park area.

On the park area are the remains of an old plantation manor, slave quarters, stables and other structures. Some of these buildings will be restored and markers will be placed at others, the idea being to give visitors some conception of a typical coast plantation where landed aristocracy flourished in pre-Civil War days.

Since 70 per cent of pulp and newsprint used in the United States is from abroad it follows that if the code restricts the establishment of paper mills, it is in the interest of foreign rather than domestic production.

FORESTRY ASS'N PROGRAM

(Continued from Page 1)

eral timber survey of the south now in progress; Dr. Chas. H. Herty, Savannah, director of the pulp and paper research laboratory at Savannah; Harry Brown, Athens, director of agricultural extension in Georgia; Dr. W. A. Hartman, Washington, D. C., soils specialist; Mrs. R. H. Hankinson, McDonough, state president of Parent-Teachers Association; Dr. C. C. Harold, Macon, noted archaeologist; Roland Turner, Atlanta.

Vocational foresters and CCC men will appear on the program the afternoon of May 11. An extensive forestry exhibit will be displayed. A visit will be made to the Gwin-Nixon State Forest. Banquets and luncheons will present an array of interesting speakers. It bids fair to be the greatest forestry meeting ever held in Georgia.

The program as outlined up to the time this publication goes to press, is as follows:

**THIRTEENTH ANNUAL CONVENTION
GEORGIA FORESTRY ASSOCIATION**

Partridge Inn Augusta, Georgia
May 10 and 11, 1934

MAY 10th

Morning Session, President Woolford,
presiding

10:00 a. m. (Eastern time)

Call to Order

Invocation—Rev. W. A. Tyson, Pastor St. John's M. E. Church

Welcome—Hon. Thomas Barrett, Jr., Mayor of Augusta

Welcome—Hon. M. H. H. Duvall, President Augusta Chamber of Commerce

Response—Mr. Roland Turner, General Agricultural Agent, Southern Railway System, Atlanta

1. "The Georgia Forestry Association"—Mr. T. G. Woolford, President, Atlanta

2. "The Need of Forestry in the Public Schools"—Mrs. R. H. Hankinson, State President, PTA, McDonough

3. "How State Agencies Can Help Farm Forestry"—Mr. Harry Brown, Director Extension Service, Athens

Appointment of Committees, Announcements, See Exhibits

Luncheon—Judge Ogden Persons,
presiding

1:00 p. m. (Eastern time)

Afternoon Session—Hon. W. T. Anderson,
presiding

2:15 p. m. (Eastern time)

4. "Indian mounds and Prehistoric Villages as State Park Sites in Georgia"—Dr. C. C. Harrold, president, Society for Georgia Archaeology, Macon

5. "C. C. C. Camps"—Hon. Robert Fechner, Director, Washington, D. C.

6. "Land Utilization in Georgia"—Dr. W. A. Hartman, U. S. Dept. of Agriculture, Washington, D. C.

7. "Timber Survey"—Capt. I. F. El-

dredge, U. S. Forest Service, New Orleans

Drive around city—4:00 p. m. (Eastern time)

Barbecue—H. H. Duvall, presiding.

7:30 p. m. (Eastern time)

MAY 11th

Business Session, President Woolford,
presiding

9:00 to 11:00 a. m. (Eastern time)

Morning session, E. George Butler,
presiding

11:00 to 12:00 M. (Eastern time)

8. "Pulp and Paper from Georgia Pines"
Dr. Chas. H. Herty, Savannah

See Exhibits

Luncheon, Thomas J. Hamilton, presiding

1:00 p. m. (Eastern time)

Afternoon session, B. M. Lufburrow,
presiding

2:15 p. m. (Eastern time)

9. General Subject, Vocational Forestry
"How I Won the Georgia Forestry Association Prize in 1933"—T. G. Walters, vocational agricultural teacher, Moultrie

"How I Won the Herty Student's Prize in 1933"—Herman Braddy, Pavo

"Vocational Agricultural Teacher's Views of Forestry in High Schools"—J. K. Callahan, Wrens; W. W. Johnson, Washington; F. M. Young, Fortsonia

10. C. C. C. Work in Georgia:

"What CCC Camp Work Means to the Enlisted Man"—Theron Davis.

of Camp P-61, Soperton

"Black Face Comedy"—Troup of CCC Men, Soperton

Music by five-piece orchestra, Soperton Camp

**SOUTHERN PINE SOURCE
OF CELLULOSE PRODUCTS**

Investigations have been started at the Pulp and Paper Laboratory at Savannah to determine the adaptability of southern pine wood for the manufacture of cellulose products such as rayon, cellophane, artificial leather, non-shatterable glass, films, photographic materials, etc.

As a step in this direction, a dispatch from Savannah announces the appointment of Royal H. Rasch, industrial chemist of Berton, New Hampshire, to carry on research relating to the cellulose uses of pine fibre. Thus far the pulp of red spruce has been largely depended upon for making rayon and other cellulose products. Dr. Charles H. Herty, director of the laboratory, is hopeful of substituting southern pine for red spruce as a source of cellulose.

"How did you break your leg?"

Woodsman—"I threw a cigarette stub in a manhole and stepped on it."—The Forest Log.

**STAFF CHANGES, GEORGIA
FOREST SERVICE MAY 1**

By reason of the resignation of Everett B. Stone, Jr., district forester, Gainesville, to accept a position with the national park service, some changes in the staff of the Georgia Forest Service take place May 1.

W. D. Young, district forester at Rome, is moved to Gainesville to succeed Mr. Stone and Russell Franklin, a new employee, takes the place of Mr. Young at Rome.

The resignation of Mr. Stone removes from the staff the oldest employee in point of service of the Georgia Forest Service except the State Forester, B. M. Lufburrow. The national park service offers a larger field of usefulness for which Mr. Stone's education and training have well fitted him. A part of his time in recent years has been devoted to Indian Springs and Vogel Park, his work attracting favorable attention of national park authorities. His headquarters, it is understood, will be in Washington.

W. D. Young is one of the older district foresters in point of service, and his record at Rome has been excellent. Mr. Young's new territory in northeast Georgia will deal with problems with which he has already become familiar in northwest Georgia.

Russell Franklin is a graduate of the School of Forestry at the University of Georgia. His home is in Dodge county. He comes to the Georgia Forest Service from the CCC camp in Seminole county where he has made an excellent record.

**CAMPOR INDEPENDENCE
DESIRED FOR U. S.**

Artificial camphor is made from turpentine, but tree camphor, controlled by Japan, once selling at \$1.00 per pound, is now down to 21 cents per pound. The producers of synthetic camphor are facing trouble with the 35 cents article they produce.

It is stated that if the camphor consumed in this country were produced from southern turpentine, about three-quarters of a million dollars worth of turpentine would be used and there would be developed that highly desirable camphor independence this country needs.

Splitting Up Rosin

Promising reports were made at the recent meeting of the American Chemical Society of work carried on by S. Palkin and C. K. Clark of the United States Bureau of Chemistry, in chemical studies of rosin, looking to an expansion of the industrial uses of rosin gums.

The research is still in the laboratory stage, but the chemists report having found a large number of different gums and some fine colors. Work of this nature is basic to a larger consumption of the naval stores products of southern pines.

FARM FORESTRY COURSE AT BALDWIN COLLEGE

A decision has been reached to introduce a practical farm forestry course at the Abraham Baldwin College, Tifton, beginning with the next session of that institution. The course will be in keeping with other lines of work carried on at the college, which in substance, is learning by doing. In this respect it will be similar to the vocational forestry work carried on successfully for the past four years at rural consolidated high schools having vocational agricultural teachers. The school and college work is to be correlated nicely according to plans now being worked out, so that when the student completes his college work he will be thoroughly grounded in the principles and practices of farm forestry.

The need of such a course in an agricultural institution training men for the farm, has been apparent to the institution leaders. Forests on school property and lands needing reforestation are available for the practice of forestry. The region is particularly adapted to growing slash and long-leaf pine, the species suited to naval stores. One of the lines of work in farm forestry to be developed is in growing pines, chipping trees and marketing naval stores products. Growing pines and marketing them for pulpwood, saw logs, poles, cross-ties, etc., will also be taught.

The forestry work in Abraham Baldwin College bids fair to meet an important need.

Pine Bond Paper Used For Printing Forestry Program

The program for the annual meeting of the Georgia Forestry Association at Augusta, May 10 and 11, has been printed on bond paper produced from Georgia pines at the Pulp and Paper Laboratory at Savannah.

Last year at the meeting of the association, those attending saw the Pulp and Paper Laboratory making newsprint paper. Since then, Dr. Chas. H. Herty and his co-workers have been experimenting with southern pine in making bond paper, a high grade paper in which Georgia clay and rosin are used along with pine fibre. The program paper is of this kind.

Struck a Sap Gusher

A group from Airline School of Hart county were grouped around Extension Forester DuPre Barrett as he applied an increment borer to a river birch to determine its age. With the removal of the core, a stream of sap spouted forth, much to the astonishment of the students. One student didn't believe it was sap even though he tasted the water, and insisted that there was a spring under the tree.

FORESTRY QUESTION BOX

What plant food elements of the soil are destroyed by fire?

Nitrogen, the element of plant food having most to do with vegetative growth of plants, is released as a gas into the air when the organic matter of the forest floor is burned. Nitrogen exists in organic matter as protein and if allowed to decay much of the nitrogen is converted into compounds of ammonia and nitrates in which forms it can be absorbed by the roots of trees as plant food.

Nitrogen is very generally the scarcest plant food element in the soil. The removal of it by fire, means slowing down tree growth, for, as a rule, a tree can grow no faster than the available nitrogen in the soil will allow.

Carbon is also destroyed by fire, but carbon is an element that the tree takes from the air as a gas, through stomata of the leaves. It is therefore, not a soil plant food. But the burning of the carbon of the organic matter of the forest floor does have an indirect influence on the fertility of the soil. So long as carbon is on the ground in combination with other elements, it affords food for organisms of decay. These organisms in turn create chemical reactions that make mineral plant food elements in the soil more readily available to the roots of growing plants.

Forest fires, therefore, impoverish the soil of its nitrogen and render the soil less efficient in supplying the tree with other plant food elements.

Are not dead trees a fire menace that should be removed from the forest?

A forest is always safer from fire when all the dead trees are removed. When a fire climbs a tree, a high wind can carry its burning embers a long distance. Ordinarily, the removal of dead trees or snags 50 to 100 feet along the firebreaks is regarded as sufficient, but during a dry period and a high wind, embers may fly a quarter of a mile or more and start a new outbreak. In fighting a fire, the burning snags should be located and men stationed in line with the wind to watch for flying embers to put them out, leaving the firebreaks to take care of the fire at other places.

Farmer (to son): Josh, I wish if you don't mind, you'd eat off to yourself instead of with the boarders.

Son: "Isn't my society good enough for the boarders?"

Farmer: Your society is fine. But your appetite sets a terrible example.

VOCATIONAL FORESTRY PRIZES OFFERED TO TEACHERS AND PUPILS

Georgia Forestry Association Offers "Herty Prizes" in Honor of Dr. Charles H. Herty — Rules Governing Prizes

The executive committee of the Georgia Forestry Association held a meeting in March 23 at Augusta and authorized two prizes to be known as "Herty Prizes" in honor of Dr. Chas. H. Herty. One of the prizes is for the vocational agricultural teacher doing the best work on the school forestry project and the other for the vocational student doing the best work in forestry.

The schools eligible to compete for the prizes are the rural consolidated high schools having vocational agricultural teachers that have obtained school forests and are carrying on work in forestry outlined by the Georgia Forest Service and the heads of vocational agricultural teaching in the state.

The following rules governing the awards are:

Teacher's Prize

Prize: A prize of \$75.00 known as the "Herty Prize" is offered the vocational agricultural teacher for excellence in presenting the subject of forestry.

Eligibility: All teachers are eligible who carry on the forestry project.

Basis of award: In making the award consideration will be given to work done in carrying out management plans of school forests; collection of tree seed; establishing a seed bed; planting of seedlings; recording and reporting diameter measurements on the quarter acre sample plots; making report of fires in the school community; student home projects in forestry; and the promotion of forestry interest in school and community.

Awarding prizes: The prize will be awarded on the closing night of the summer forestry camp.

Prize for Students

Prize: The sum of \$50.00 will be awarded the student who has done the best work in forestry.

Eligibility: 1. Students eligible for the prize are those who have won vocational forestry camp scholarships and have completed six weeks of camp work.

Basis of Award: 2. The prize will be awarded the student who makes the best grade in winning a camp scholarship; the best grades at two sessions of the school camp, and does the best work on his home forestry project.

Awarding prize: 3. The prize will be given at the closing of the summer forestry camp.

FIRST DISTRICT

W. D. Young, District Forester Rome

CCC Items

Camp P-77, located in Pickens county, will be transferred around the 1st of May. The enrollees at Camp P-77 will go to Butler camp at Butler, Georgia, taking places of enrollees originally sent to Butler camp from Mississippi. The Mississippi boys will be transferred back to their home state.

Equipment of P-77 will be transferred to Vicksburg National Military Park, Vicksburg, Mississippi, by truck.

Camp P-58 has been changed over to a Park camp, under direction of Department of Interior. This camp will continue at its present location at Ellijay, Georgia, and will work on the new Fort Mountain State Park as well as continue with forest activities.

On account of increased work in connection with CCC activities, the district forester has been unable to get around to all the vocational schools in his district; however, by the 1st of May a visit will have been made to all vocational schools and demonstrations will be held.

in improving the Gwinn-Nixon State Forest near Augusta, have been donated to the poor through the relief agencies of Richmond county. The relief agencies collected the wood and hauled it away. Most of the clearing consisted of black gum.

Crawfordville Camp Site Has Park-Like Appearance

The camp that is devoting itself to the Alexander Stephens Memorial Park at Crawfordville has beautified its camp site until it has a park-like appearance itself. It is believed to be one of the most beautiful camps in Georgia. The grounds are covered with a good, well-kept lawn grass, sown by the camp workers. An arched entrance made of greyish-white river birch, and the same type of wood for fences, give the grounds a picturesque, rustic appearance. Stones mark the borders of roads and foot paths. Well constructed log buildings are used by the camp superintendent and officers. Loblolly pines and cedars scattered over the area add beauty to the scene. Neatness and order pervade the park camp.

It is, therefore, no wonder that the Alabamians who have made the camp and have made it a home for a year, do not like to pull up and move to a new camp.

Mr. A. F. Conradi, planting foreman in charge, made a detailed and systematic report covering the entire operation. This report, too long to be printed in full here, gives some very pertinent information regarding the planting of pine seedlings. Of particular interest is the efficiency and speed of planting as affected by the weight and balance of home-made planting irons as against irons manufactured by the Council Tool Company, which we happened to be using.

The home-made irons were designed after the Council planting iron by the Camp blacksmith but were made heavier and more clumsy, weighing about 18 lbs. as compared to about 10 lbs. for the Council iron. The difference in weight and balance, and the fact that the home-made irons broke a number of times, caused us to form the opinion that the greater efficiency of the Council planting iron is much cheaper to the planter, both as to cost and better setting of seedlings, than the home-made iron. Of course with our newly acquired knowledge and experience we could greatly improve our home-made irons — could possibly make them equal in efficiency to the bought iron, but the fact now stands out that on our initial experience at making and using home-made planting irons we were the losers thereby, both as to total planting cost and proper setting of seedlings.

Among other factors affecting planting efficiency and planting cost were experience, interest, and aptitude of individuals doing the planting. I want to say here that the interest of the CCC personnel in this planting was all that could be desired of any planting crew. None had any previous planting experience of this nature, but almost without exception the men quickly acquired a satisfactory degree of efficiency in executing their jobs. This was undoubtedly due to their intense interest and desire to learn this practical and popular forestry problem of planting and putting to proper use the unproductive idle lands of Georgia.

Further study shows that it will pay to carefully plan the planting operation, not only as to planting irons and personnel, but as regards weather, preparation of planting site, dampness of soil, heeling in and lifting of seedlings, proper loblolly of mud to keep roots of seedling in between plant bed and planting, equipment other than planting irons and other factors too numerous to mention here.

The cost of planting, spacing being 8 feet rows with seedlings 6 feet apart in rows, and not including cost of seedlings, varied from $\frac{1}{4}$ to $\frac{1}{2}$ cent per seedling of Longleaf, and 1-5 to 1-3 cent per seedling of Loblolly pine. The above variations in cost of planting per seedling were due principally to the wide variation in physical character of the soil and its influence on the number of seedlings that were planted per hour. The number of seedlings



Camp Superintendent's Quarters at Crawfordville—Entire Camp Site Given Park-like Treatment.

THIRD DISTRICT

C. N. Elliott, District Forester Augusta

Green Firebreaks

Firebreaks on the Gwinn-Nixon State Forest near Augusta are now growing oats. The object of having planted firebreaks is to utilize the land of these strips. During the winter and spring the green firebreaks have served their purpose very effectively. A disastrous forest fire, intense enough to kill tall pines, stopped at the green barrier of oats and none of the trees on the state forest were damaged.

Fuel from State Forest Distributed Through Relief Agencies

About 100 cords of wood cut by CCC men

FOURTH DISTRICT

W. G. Wallace, District Forester Columbus

A Practical Planting Demonstration by the E. C. W.

During the planting season now ended the E. C. W. Camp at Warm Springs made a planting of approximately 100,000 pine seedlings on public property near Mableton, Georgia. This planting is the beginning of a demonstration forest of several hundred acres which will not only demonstrate the planting of idle land to forests, but is also to show the value of the forest in arresting and preventing soil erosion. This planting is also a watershed demonstration problem in preventing rapid run-off of rain water and thereby conserving the water supply and preventing silting of streams.

planted per hour varied from 67 to 153 for longleaf; and 98 to 184 for loblolly pine.

I believe that by profiting from our previous experience we could reduce this cost of planting possibly 25 per cent or more.

SIXTH DISTRICT

Jack Thurmond, Dist. Forester
Savannah

Emanuel T. P. O. Constructing Firebreaks

Members of Emanuel County T. P. O. have constructed approximately 300 miles of secondary firebreaks during the quarter from January to April, as their requests for reimbursement indicate.

Most of the work was done with 2-horse turning plows, equipped with terrace wings, which makes the sod turn over more easily and leaves a cleaner break. This particular fire break is plowed solid to a width of 10 feet and makes a very satisfactory place to fight fire from in back firing.

Firebreaks constructed in the above manner cost an average of \$3.00 per mile and one 2-horse team can build around a mile per day. They are also easy to maintain the following year at little cost by running over them with a mule drawn disc harrow. Maintenance of this type costs \$1.00 per mile and is very effective.

E. C. W. News

Camp P-57 located in Screven county will be moved at an early date. The equipment will be sent to Alabama for use on soil erosion control projects and the enrollees will occupy the camp at Baxley, Georgia.

This camp has just about finished work on the Brier Creek T. P. O. and constructed a very effective truck trail and fire break system used in preventing and suppressing forest fires.

The tower crew at Camp P-53, Hinesville, is now engaged in building tool houses at each tower site for use in storing fire fighting equipment.

The houses are made of Cypress logs, ranging from 10 feet to 12 feet in length. The floors are pine boards 2 feet by 8 feet and the roof is cypress shingles.

The T. P. O. members gave the blocks and a mill man sawed them on halves for us. The houses were constructed very economically and are substantial for the use to which they will be put. Fire fighting equipment which will be stored in each house will consist of three fire pumps, three fire swatters and three axes, or enough equipment for a five man crew.

EIGHTH DISTRICT

Albany
H. D. Story, Jr., Dist. Forester

State Nursery Planted

Although the supply of tree seed was scarce in 1933 and difficulty was experienced in getting them, the tree nursery beds at Albany have been planted and

seedlings are making their appearance. Germination has been excellent and the stand is good.

Flint River T. P. O.

Members of the Flint River Timber Protective Organization had a business meeting April 2 at the camp in Decatur county. Protection measures were discussed; quarterly assessments were approved and arrangements were made to employ a competent ranger for educational work, as well as for fire patrolling and assisting the land owners on their protection problems. This organization promises to become a very active organization. The interest has grown with the establishment of the camp.



Novel Corkscrew Tap Roots

Corkscrew Tap Root

A seedling lifted from the tree nursery at Albany is classified by the district forester as "*Pinus alcoholus*" from the fact that its tap root has a well defined corkscrew arrangement. It is thought that it, too, has been up against the depression, or restricted opportunities, and being unwilling to give up, kept striving for a downward development, intent upon penetrating the stopper with a cork screw, as shown by the illustration.

Cartoonist Conservationist Head Biological Survey

Jan N. Darling, otherwise known as "Ding", the cartoonist and leader in movements to conserve wild life, is now Chief of the United States Biological Survey, succeeding Paul G. Redington, resigned.

A native of Michigan, but a long time resident of Iowa and newspaper cartoonist, his leadership in wild life conservation has led to his appointment to membership in the President's Committee on Wild Life Restoration and Migratory Bird Conservation Commission of the U. S. Department of Agriculture. He is vice president of the American Forestry Association, national

director of the Isaac Walton League of America, and member of the Iowa Game and Fish Commission.

NATIONAL FOREST QUARTERS LOCATION AT ATLANTA

A new national forest district has been created with Atlanta as headquarters. Joseph C. Kircher, who has been supervisor of District Seven, with headquarters at Washington, D. C., will be in charge of District Eight, the new division, with his headquarters in Atlanta. Mr. Kircher has been administering national forests in the south as well as in the east. The growth of national forest area has made it advisable to divide the territory. National forest areas in Virginia, Kentucky, North Carolina, Tennessee, South Carolina, Florida, Georgia, Alabama, Mississippi, Louisiana and Texas will be included in District Seven.

Mr. Kircher will be welcomed to the south to which he is already wedded by finding his wife at Albany, Georgia, as well as by his interest in promoting southern forestry.

How Long are Longest Longleaf Pine Needles

Botanists describe the longleaf pine (*Pinus Palustris*) as having needles 12 to 15 inches in length. Doubtless that describes the average length of needles, but bundles of needles 24 to 26 inches in length were sent to District Forester H. D. Story, Jr., by Professor Geo. I. Martin, vocational agricultural teacher at Sylvester, and in turn these were sent to the office of the Georgia Forest Service, where they are on exhibition.

Can anyone find bundles of needles longer than 24 to 26 inches?

NEW NATIONAL FOREST UNITS AND EXTENSIONS

Thirteen new national forest units and enlargements of 13 existing units have been approved for purchase by the National Forest Reservation Commission. More than 7,300,000 acres are involved in the purchase proposals.

President Roosevelt allotted \$20,000,000 for acquisition of 8,000,000 acres of forest lands as a conservation and relief measure.

Approvals for purchase involve four units in Texas with gross area of 1,400,000 acres; in Missouri, two new units and four enlarged new purchase areas total 1,677,840 acres; two in North Carolina and two in South Carolina with combined area of 1,500,000 acres; one new unit in Mississippi of 382,000 acres; one new unit in Louisiana of 333,572 acres; a new unit in Kentucky of 379,000 acres at Cumberland Falls.

Purchases in extensions of national forests partially located in Georgia are 2,899 acres for Cherokee National Forest and 370 acres for Nantahala National Forest.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

VERMICULITE, THE HEAT-INSULATOR OF TOMORROW

By

RICHARD W. SMITH, *State Geologist*

Vermiculite, like kyanite, is another example of a mineral long known in mineral collections, but considered valueless until recent uses have brought it into commercial prominence. Bulletin 2, of the Georgia Geological Survey, published in 1893, describes this mineral as occurring in the corundum mines of Georgia.

Vermiculite is the name applied to a group of bronze-colored hydrous micas which, when heated to red heat or above, expand or exfoliate to a very light, fluffy material weighing only from 5 to 10 pounds per cubic foot. It is this power of expansion that has given the name of *vermiculite*, meaning "to breed worms", to the material. This exfoliation is probably due to the chemically-combined water being suddenly turned to steam, forcing apart the microscopic flakes or plates of which the mineral is composed. The expansion is always at right angles to the cleavage. During the exfoliation the bronze color of the mineral usually brightens.

The crude vermiculite appears as a mass of dark brown or dull bronze-colored micaceous flakes or small sheets which lack the elasticity of muscovite or biotite mica. It is usually mined by pick and shovel, roughly screened to remove clayey impurities, and dried carefully at a low heat. It has been found that the best results are obtained by crushing, screening, and sizing the crude material before expansion. The expansion or exfoliation is accomplished in a rotary kiln or in a patented expansion furnace that instantly subjects the material to a temperature between 1800 degrees F. and 2000 degrees F., and then suddenly cools it.

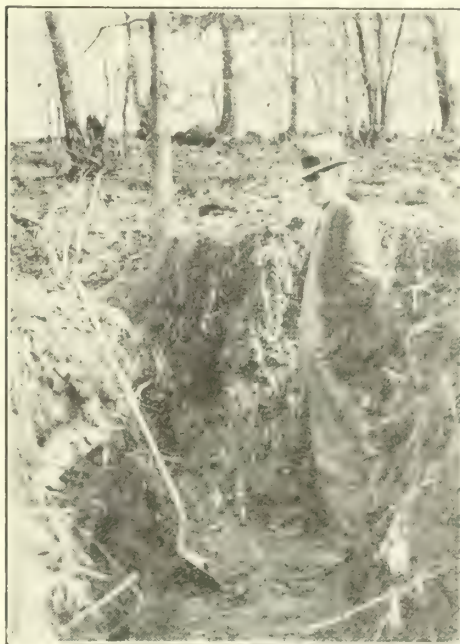
Uses of Vermiculite

The uses to which exfoliated vermiculite has been put recently may be listed under two groups: first, those dependent on the bright bronze color of the material; and second, those dependent upon its extreme lightness and heat-insulating properties.

The brighter colors of ground and exfoliated vermiculite may be used in pigments and inks in place of powdered bronze. It is claimed that the bronze-colored background on the packages of a popular brand of cigarettes is printed with an ink made from vermiculite powder. It has been successfully applied to wall papers as a decorative medium.

The exfoliated vermiculite is an excellent heat insulator. It may be used loose or manufactured into insulating boards for use in refrigerators, ovens, fireless cookers, incubators, etc. When used to fill the hollow spaces in walls and over ceilings it is said to make houses warmer in winter and cooler in summer. It could be used between two sheets of metal in the manufacture of standard units for the pre-fabricated metal houses of the future that were predicted by the Century of Progress Exposition at Chicago. Similarly it can be used to insulate the air-conditioned Pullman cars.

Vermiculite can be used as an insulator and fireproofing material in safes and filing



Vermiculite Prospecting, Jethro Burrell Property, Towns County

cabinets. Heat-insulating bricks made by using a suitable binder with exfoliated vermiculite can be used with a fire brick lining in boiler settings and furnaces with a considerable reduction in the weight and thickness of the walls necessary. Plastic cements containing vermiculite have good insulating qualities. Pipe and boiler coverings containing expanded vermiculite are said to be lighter weight and more effective than with asbestos.

Exfoliated vermiculite, in the form of both wall board and wall plasters, is said to have excellent acoustic properties, making it of value in the construction of theaters, moving picture studios, apartments, etc.

The lubricating qualities of vermiculite are said to be comparable to those of flake graphite. It also has the property of coagu-

lating or hardening oils so that it may be used instead of aluminum stearate, and at the same time serve as a valuable lubricant.

The largest known deposit of vermiculite is near Libby, Montana. It is said to be in the form of a dike-like body, at least 100 feet wide and 1,000 feet long, and has been extensively mined for several years. Other deposits have been found in Colorado, Wyoming, and Pennsylvania.

Deposits in Georgia

Vermiculite was found in the old corundum mines of North Carolina and Georgia. At the Laurel Creek Mine in Rabun county, Georgia, the corundum occurred in a matrix of vermiculite, and advantage was taken of its exfoliation and consequent light weight to clean the corundum. The ore from the mine was fed through a crude furnace, the heat of which expanded the vermiculite and the draft carried it out the stack, the corundum being discharged through the bottom of the furnace. Recent prospecting has disclosed deposits of vermiculite in Macon and Clay counties, North Carolina, and in Rabun and Towns counties, Georgia. Commercial shipments have been made from Franklin and Hayesville, North Carolina.

The vermiculite of these deposits appears to be a product of hydrothermal alteration and usually occurs in a zone or envelope of alteration products surrounding an ultrabasic intrusion such as olivine or dunite. The commercial vermiculite appears to be in discontinuous vertical layers or streaks from a few inches to a few feet in thickness, surrounded by clayey vermiculite, clay containing a small amount of vermiculite, chloritic material, and other alteration products. Small pegmatite streaks and veins are numerous and may have furnished the heated waters that altered the mica to vermiculite.

The United States Geological Survey, by means of a direct grant from Public Works funds, will soon investigate the vermiculite deposits of Georgia. Although vermiculite has so far only been found in Rabun and Towns counties, it is possible for it to occur anywhere in the Piedmont Plateau and mountain sections of the state. Deposits of olivine, an olive-green mineral; dunite, a rock composed of olivine and small amounts of chromite, magnetite, etc., and other basic rocks occur in a number of counties. They are especially abundant in a belt that enters the state from Alabama in Troop and Harris counties and extends northeastward, entering North Carolina from Towns and Rabun counties. The deposits of these basic rocks and their other alteration products—serpentine, soapstone, talc, chlorite, asbestos, and corundum—should be searched for vermiculite.

The cooperation of the people of these counties in locating all possible deposits is asked. Any suspicious material should be tested to see if it expands on heating. A thin flake of commercial vermiculite will

(Continued on Page 8, Col. 3)

SUMMARY CCC WORK UNDER GEORGIA FOREST SERVICE

Work Concluded on Some Areas— Shifting of Several Camps by May First—Considerable Forestry Work Done in Year

With May 1, the Civilian Conservation work starts on a new year. Several camps are moved in Georgia, a few to other states. The amount of work to be done for the next six months period on private lands, organized under Timber Protective Organizations, will be less, the amount of state parks and national forests more than for the past six months.

The following summary of work accomplished up to April 1 at each camp under state supervision is as follows:

P-52, Homerville, Ga.—36 miles of telephone line; 123 miles firebreak; fire hazards removed from 3,253 acres; 3 lookout towers; 1,153 man days fighting fire; .4 mile truck trail; 53,165 acres type-mapped; 542 miles lineal survey; average workers per month 149.

P-53, Hinesville, Ga.—31 miles telephone; 112 miles firebreak; 3 lookout towers; 454 man hours fire fighting; 35 miles truck trail; 27 miles truck trail maintenance; 1 bridge; 232,000 acres type-mapped; 542 miles lineal survey; 40 bridges; average workers per month 134.

P-54, Albany, Ga.—30 miles telephone; 114.9 miles firebreak; 1,862 man days fighting fire; 35 miles truck trail; 98.7 miles maintenance truck trail; 102,000 acres type-mapped; 135 workers each month.

SP-1, Indian Springs—35 man days fire fighting; 8 miles truck trail; 3.5 miles foot and horse trail; 8 bridges; 5 acres landscaped; 2,600 square yards of earth removed; 22 plantings; workers per month 134.

SP-2, Blairsville — 19 miles telephone constructed; 215 acres fire hazard removed; 13.8 road and truck trail clearance; 1 fire tower; 355 man days fighting fire; 15.2 miles truck trail; 6 miles maintenance truck trail; 11.8 miles foot and horse trails; 4 miles foot and horse trails; 10 bridges; 50 acres type-mapped; 16 miles lineal survey; 20 acres landscaped; workers per month 120.

P-56, Warm Springs — 40 miles telephone; 22 miles firebreaks; 29.5 miles side clearing of roads and trails; 3 lookout towers; 462 man days fire fighting; 40.7 miles truck trail; 3 bridges; 120 miles lineal survey; 100 plantings; workers per month 133.

P-57, Waynesboro—4.5 miles telephone; 31.1 miles firebreak; 28 miles road and trail side clearings; 905 man days fire fighting; 56.8 miles new truck trails; 18 bridges; 176,000 acres type-mapped; 105 miles lineal survey; 151 workers per month.

P-59, Fargo—15.5 miles telephone; 105.5 miles firebreaks; 1163 acres fire hazard reduction; 214 man days fire fighting; 24.6 miles truck trails; 24.6 miles maintenance truck trails; 28.3 miles foot and horse trails; 23.3 miles maintenance foot and horse trails; 139 bridges; 162 miles lineal survey; 116 workers per month.

P-60, Woodbine—62 miles telephone; 134 miles firebreak; 3216 acres reduction fire hazard; 2 lookout towers; 1076 man days fire fighting; 23,200 acres type-mapped; 178 miles lineal survey; 128 workers per month.

P-61, Soperton — 30.2 miles telephone; 254 miles firebreaks; 4789 acres reduction

fire hazard; 2 lookout towers; 534 man days fire fighting; 5 miles truck trails; 7 bridges; 197,000 acres type-mapped; 134 workers per month.

P-62, Baxley — 44 miles telephone; 116 miles firebreak; 2205 acres reduction fire hazard; 1 lookout tower; 747 man days fire fighting; 69,000 acres type-mapped; 312 miles lineal survey; 132 workers per month.

P-63, McRae—125 miles firebreaks; 82 days fire fighting; 3 miles truck trail; 77,000 acres type-mapped; 3 bridges; 113 workers per month.

P-64, Crawfordville—12 miles telephone; 6.3 miles firebreaks; 70 acres fire reduction hazard; 15 miles road and trail side clearing; 143 man days fire fighting; 25 miles truck trails; 1.1 foot and horse trails; 36 bridges; 24,340 acres type-mapped; 3.8 miles lineal survey; 55 acres landscaped; 500 square yards dirt removed; 1 acre planted; 135 workers per month.

P-65, Jesup — 1.3 miles telephone; 79.5 miles firebreaks; 1735 acres fire hazard removed; 723 man days fire fighting; 11,233 acres type mapped; 93 miles lineal survey; 111 workers per month.

P-66, Brooklet — 59.2 miles firebreaks; 2580 acres fire hazard removed; 17.3 miles roadside and trailside clearings; 73 man days fire fighting; 5 miles truck trails; 28.3 miles truck trails maintenance; 60,419 acres type mapped; 15 bridges; 110 workers per month.

P-67, Bainbridge — 20 miles telephone line; 200 miles firebreaks; 1014 man days fire fighting; 2.2 miles truck trails; 138,400 acres type mapped; 619 miles lineal survey; 137 workers per month.

P-68, Douglas—30 miles firebreaks; 9.8 miles maintenance road and trail sides; 100 man days fire fighting; 45 miles lineal survey; 104 workers per month.

P-69, Commerce — 27 miles telephone line; 1200 acres fire hazard reduction; 62 miles roadside clearing; 2 lookout towers; 32.8 man days fire fighting; 42 miles truck trails; 25 miles maintained truck trails; 20 miles foot and horse trails; 16,050 acres type mapped; 38 bridges; 140 workers.

P-70, Nahunta—26 miles telephone line; 124 miles firebreaks; 2 lookout towers; 2106 man days fire fighting; 1970 acres type mapped; 274 miles lineal survey; 12 bridges; 126 workers per month.

P-71, St. George — 34 miles telephone lines; 147.7 miles firebreaks; 3549 acres reduction fire hazard; 10 miles clearance road and trail sides; 1 lookout tower; 989 man days fire fighting; 2 miles truck trail; 70,000 acres type-mapped; 165 miles lineal survey; 114 workers per month.

P-72, Waycross — 21.7 miles telephone line; 154.6 miles firebreaks; 3750 acres cleared of fire hazard; 1 lookout tower; 1958 man days fire fighting; 73,970 acres type mapped; 385 miles lineal survey; 149 workers per month.

P-73, Hiawassee—16.8 miles telephone; 1.5 miles firebreak; 24.6 miles clearance of trail and roadsides; 209 man days fire fighting; 14.9 miles truck trails; 6 miles truck trail maintenance; 16 miles foot and horse trail; 60 bridges; 127 workers per month.

P-74, Toccoa Falls—5.6 miles firebreaks; 17.2 miles road and trail side clearing; 1 fire tower; 510 man days fire fighting; 47.4 miles truck trails; 47.5 miles truck trail maintained; 4.5 miles new foot and horse trails; 3.7 miles foot and horse trails maintained; 12,850 acres type mapped; 57.5 miles lineal survey; 84 bridges; 133 workers per month.

P-75, Fort Gaines—25 miles telephone line; 85 miles firebreaks; 98 miles road and

trailside clearance; 1 lookout tower; 1172 man days fire fighting; 79 miles truck trails; 55 miles maintenance truck trails; 91,905 acres type mapped; 59 bridges; 138 workers per month.

P-76, Chula—34 miles firebreak; 152 man days fire fighting; 1 bridge; 135 workers per month.

P-77, Tate—14 miles telephone line; 1 lookout tower; 829 man days fire fighting; 10.5 miles truck trails; maintenance 20 miles truck trail; 28.5 miles foot and horse trail; 132 bridges; 121 workers per month.

P-78, Butler — 171 miles firebreak; 1 lookout tower; 1017 man days fire fighting; 117,432 acres type mapped; 1 bridge; 114 workers per month.

P-79, Cornelia — 13.5 miles telephone line; .4 mile firebreak; 2525 acres fire reduction hazard; 36.9 miles road and trailside clearance; 2 lookout towers; 224 man days fire fighting; 22.9 miles truck trails; 68 miles truck trail maintenance; 13.9 miles foot and horse trails; 32 bridges; 137 workers per month.

P-80, Menlo — 2.8 miles firebreak; 324 acres fire reduction hazard; 14 miles road and trailside clearance; 100 man days fire fighting; 8 miles truck trail; 8 miles truck trail maintenance; 21 bridges; 98 workers per month.

P-81, Bloomingdale — 57.5 miles firebreak; 1834.2 acres fire hazard reduction; 176 man days fire fighting; 4.6 miles new truck trails; 8 miles truck trails maintained; 36,483 acres type-mapped; 84.8 miles lineal surveys; 3 bridges; 133 workers per month.

P-82, Reidsville—2.5 miles telephone line; 115 miles firebreaks; 2250 acres fire hazard reduction; 2 miles road and trailside clearance; 310 man days fire fighting; 2 miles new truck trails; 52,000 acres type-mapped; 173 miles lineal surveys; 132 workmen per month.

Georgia Topographic Maps Obtainable from State Geologist

A supply of topographic maps of Georgia, made by the United States Geological Survey, is now available at the office of State Geologist Richard W. Smith, 42 State Capitol. They can be obtained at cost which is about 10 cents each.

Most of north Georgia, and a considerable strip of eastern and southeastern Georgia have been mapped. Other parts of Georgia have never received a topographical survey for lack of state aid.

VERMICULITE

(Continued from Page 7)

start to expand when heated with a match but the best test is to place a piece on sheet of metal and heat it over coals nearly red heat. Commercial vermiculite will expand to several times its original size. Samples that meet this test should be mailed to the State Geologist, 425 State Capitol, Atlanta, Georgia, together with description of the deposit and its location or should be shown to the government geologist when he comes to look for deposits in that county.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

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No. 6

FORESTRY ASSOCIATION MEETING ONE OF GREAT INTEREST

Splendid Addresses of Notable Speakers — Cordial Hospitality of Augusta — Excellent Exhibits Association Meets at Macon Next Year

The thirteenth annual meeting of the Georgia Forestry Association, held May 10 and 11 at Augusta, was outstanding in several particulars. The declarations of the prominent speakers on vital forestry problems are likely to make the meeting memorable. Some of these are as follows:

President T. G. Woolford denied that private forestry had failed, as claimed by federal forestry authorities. He challenged anyone to show how the federal authorities could do a better job than is being done by many timber owners in Georgia. He charged the Copeland Report of Congress with carrying propaganda favoring government ownership of forest lands of the country.

Robert Fechner, director of CCC work of the nation, strongly favored the continuance of federal conservation work in forestry beyond the present allotted period. The association passed a strong resolution in support of such steps.

Dr. Charles H. Herty, director of research at the Pulp and Paper Laboratory at Savannah, presented to the convention pages of the Savannah Press printed on paper made solely of ground pine wood, a paper that felted perfectly and reproduced print and illustrations in a manner to compare favorably with the Swedish product of mixed ground wood and sulphite fibre used for the regular run of the newspaper. Dr. Herty declared that there was a differential of \$20 per ton in favor of paper made from southern pines; that the South needed no tariff on newsprint paper; it needed only capital to perpetually supply the needs of this country. He also announced that in the study of the alpha cellulose content of southern pine wood, it was found to equal that in red spruce now generally used to make rayon and other products.

Captain I. F. Eldredge, New Orleans, in charge of the forest survey of the south,
(Continued on Page 2, Col. 1)

DANIEL M. BYRD TAKEN BY DEATH

Daniel Madison Byrd, member of the Commission of Forestry and Geological Development, died suddenly as the result of a heart attack, at his home in Atlanta on the night of April 30. In his death the Commission loses the newest and one of the ablest of its members. Early this year Mr. Byrd was appointed by Governor Eugene Talmadge. Shortly after attending his second meeting of the commission, death ended his career.

As a member of the commission he had given much time and thought to important problems arising in connection with forest and park activities, and with civilian conservation corps work. One of his last official acts was in relation to the new San Domingo Park.

Mr. Byrd's training and experience, along with his high mental endowment and fine judgment, made of him a very valuable executive. His keen sense of responsibility led him to be aggressive in carrying out every duty his office imposed upon him. It was so when he served the public as an officer of the Game and Fish Department of



DANIEL M. BYRD DIES

the State, and it was so during the short time he served the Commission of Forestry and Geological Development. His personality was such as to make him companionable in the highest sense of the term.

Mr. Byrd was born at Lawrenceville, Georgia, May 30, 1884, the son of Mr. and Mrs. J. P. Byrd. He graduated from the law school of the University of Georgia in 1908 and began the practise of law with his uncle, Col. W. E. Simmons, at Lawrenceville, and later became editor of the Lawrenceville News Herald.

In 1918 he entered the legal department of the International Chemical Company and made his headquarters in Atlanta. In 1922 he became general counsel of the Retail Credit Company of Atlanta, an organization of international scope, and served in this connection with conspicuous success until his death.

Mr. Byrd was married to Miss Nanaline King, member of a prominent family at Lawrenceville, and has two sons, Daniel Madison Byrd, Jr., and James King Byrd, who survive him. Others to survive him are his wife, J. P. Byrd, his father living at Lawrenceville, five sisters, Mrs. Scott Candler, Decatur; Mrs. L. R. Martin, Lawrenceville; Mrs. Wilbur Blake, Calhoun Falls, S. C.; Mrs. Sam Martin and Miss Cora Byrd, of Lawrenceville, and two brothers, J. P. Byrd, Jr., Tulsa, Oklahoma, and Fred Byrd, Lawrenceville.

Mr. Byrd was a member of the Old Guard of Atlanta, the Druid Hills Methodist Church; a member of the staffs of Governor L. G. Hardman and Governor Eugene Talmadge, and belonged to various civic and social organizations.

Stewart Naval Stores Inspector

Charles E. Stewart, Douglas, Ga., was appointed by Governor Eugene Talmadge as Naval Stores Inspector of Georgia effective May 15. He succeeded Harp M. King, who had served in that capacity 24 years.

Mr. Stewart was formerly connected with the naval stores industry, retiring about ten years ago, now to return in an official capacity as a representative of the state.

Mr. Stewart has been prominent in state affairs, gaining his reputation as an aggressive and forceful leader while a member of the State Legislature.

Forestry-Geological Review

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State Capitol, Atlanta
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H. M. Sebring, Asst. State Forester, Atlanta
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C. B. Beale, District Forester, Waycross
W. D. Young, District Forester, Rome
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Lane Mitchell, Asst. State Geol., Atlanta
Miss Margaret Gann, Clerk, Atlanta

Extension Foresters

Bonnell Stone, Chairman, Oxford
Dupre Barrett, Athens
K. S. Trowbridge, Tifton

FORESTRY ASSOCIATION

(Continued from Page 1)

expressed the opinion that there is enough pine timber in the south to supply paper needs of the country now, and for all time through sustained yields.

Mrs. R. H. Hankinson, McDonough, Ga., former president of the Parent Teachers Association of Georgia, declared that the failure of the country to take care of its forests is due to a lack of education, to a failure to include in the public school curriculum anything about forestry. She asked the privilege of the Parent Teacher Association cooperating with the Georgia Forestry Association in remedying this defect in the Georgia Public School System.

Harry Brown, Athens, director of agricultural extension, declared that it should be made unlawful, if it is not already, for any land owner to allow the washings from his gullied lands to fill up stream beds and damage the best lands of his neighbors. He favored taking out of cultivation lands too steep to hold the soil in place, and put them to growing trees.

From the opening of the session in Part-ridge Inn with an invocation to the amusing stunts of the CCC boys at the close, the program was replete with interest, many saying it was the most interesting of all the programs of the association.

The Association voted to have the next meeting at Macon and reelected T. G.

Woolford, Atlanta, president and Bonnell Stone, Oxford, secretary. A full list of officers appears elsewhere.

The session was opened with an invocation by Dr. W. A. Tyson, followed by a welcome address on behalf of Augusta by Hon. R. E. Allen, mayor pro-tem, in which he complimented the unselfish motives of an association in building for the future. On behalf of the Chamber of Commerce of Augusta, Hon. H. M. Duvall felicitated the association upon the prospect of hearing such an array of eminent speakers, and pledged the Chamber of Commerce to every act of hospitality within its power.

In response, Roland Turner, Atlanta, accepted the welcome of Augusta and called attention to the great obligations belonging to an association serving a state with 23,750,000 acres of timber land, hardly a million of which was virgin timber. The abandoned farm land now restocking to trees would swell the timberland area, but instead of being alarmed at the reduction of cultivated lands, thanks to Dr. Charles H. Herty, the timberlands are facing a new and profitable demand.

As the value of timberland grows, Mr. Turner looked forward to the time when people would be moved to do something about forest fires as they do when they see a house on fire.

Address of Mr. Woolford

In his address on the work of the Georgia Forestry Association, President T. G. Woolford briefly reviewed its history and achievements, declared the position of the association on fundamental forestry questions, and outlined its objectives.

The Association, he said, had been formed in 1921 at Macon, after the Georgia committee of the Southern Forestry Conference had paved the way. Annual meetings in subsequent years were held in various parts of the state to arouse interest in forestry. In 1925 the association successfully sponsored a bill creating the Georgia Forest Service, borrowed money and provided quarters for the state's first and only State Forester, B. M. Lufburrow. Then the association had to look after litigation to save the department, the constitutionality of the allocated tax supporting the department having been attacked.

It also fell to the lot of the association to foster legislation relating to forestry. One of the most difficult undertakings of the kind was under the state reorganization, to keep the forest service from being placed under the Department of Game and Fish.

At the same session, the association succeeded in getting through an appropriation of \$40,000 to help Dr. Herty inaugurate his pulp and paper research, the first appropriation any state had made for such a purpose. The outcome is well known, about which Dr. Herty would speak later on.

The association had appreciated from

the start the importance of reaching the schools, and joined with the American Forestry Association in a moving picture program for every school, white and colored. In support of the educational program of the Georgia Forest Service with Smith-Hughes rural high schools, the association had shown its approval by giving prizes to teachers and students doing the best work in forestry. Assistance had been rendered to various other public schools by distributing a pamphlet prepared for the purpose, that was used by many teachers in the state.

The association had approved and given encouragement to the formation of Timber Protective Organizations, now defending effectively against fire more than 3,000,000 acres in the state. It had fostered parks. From one park of 12 acres, the association has witnessed a growth to 6 parks, with a total of 2,014 acres.

The association had a hand in planning, along with the State Forester, the work to be undertaken by CCC men in Georgia.

Mr. Woolford said the main objective of the association is commercial forestry. He denied that private ownership had failed, as claimed by federal authorities, from whom he quoted. While there had been many failures in handling private forests, he did not believe that in some instances national forests have yet the right to claim that they have been a success. He said he had challenged federal forest authorities to show how they could do a better job of forest management than a number of private owners are doing in south Georgia and that if they could, he would withdraw his objections to the government purchasing forest lands in south Georgia.

Mr. Woolford reviewed activities of the federal government, led by the late Senator Harris to acquire national forests in southeast Georgia and of the association's opposition.

Mr. Woolford had no uneasiness about growing the timber this country consumes. Maximum consumption per capita was in 1907, when it was 470 board feet. Since then it had declined. He thought that around 250 board feet per capita could be expected in the future.

Were the government to purchase all the land recommended in the Copeland report, Mr. Woolford said, the government would own 50 per cent of the forest land of the country. He said the report contained propaganda for government purchase.

Mr. Woolford highly approved the work of conservation carried on by CCC camps, saying it was one of the most valuable and effective pieces of work ever done by the federal government.

Need of Forestry in Public Schools

Mrs. R. H. Hankinson, McDonough, former president of the State Parent Teachers Association, made a brilliant address on

the subject "The Need of Forestry in the Public Schools."

The point of tangency between the Georgia Forestry Association and the Parent Teachers Association is in education, she said, and emphasized strongly that we get what we educate for. China taught respect for elders and has ancestral worship. Persia taught chivalry, and having neglected material things, was a short-lived nation. The Jews emphasized morals and education and produced moral and intellectual giants, but lacked the power to organize for security. The Romans educated soldiers and contestants for the arena, but could not endure in a conflict with righteousness. Greeks educated for music, philosophy and physical beauty, and with all its great achievements, failed to lift the masses that finally pulled it down.

America, she said, is built on a pillar of education, with its security dependent upon education. But in its educational program, there is a weakness—forestry education has been overlooked. The result has been failure in conserving the nation's forest resources.

At first there was too much forest. The attitude of the pioneers has been carried over to the present generation. Forest wealth is neglected. Fires are allowed to burn them, insects to destroy them, no thought is given to future needs for forest products. For this, the country's educational program is to blame. Neither old folks nor children think forestry.

While an excellent forestry program has been inaugurated in the Smith-Hughes schools of the state, she said, the great mass of pupils go through school with scarcely a mention of one of the greatest resources of the country.

Mrs. Hankinson pledged the cooperation of the Parent Teachers Association with the Georgia Forestry Association to have forestry introduced in every school in the state.

Cooperation in Forestry Program

Harry Brown, Director of Agricultural Extension of the State College of Agriculture at Athens, made a plea for the cooperation of state agencies in carrying on a program of reforestation, forest protection and land utilization. He said that forestry was a sort of religion to him. The forests to him, especially those on mountains among which he grew up, make an inspiring appeal. Naturally he does not want to see the forests mistreated. Mr. Brown spoke earnestly of the necessity of restoring the forest to land from which he said the trees should never have been removed, steep lands on which there is no practical way to hold the soil in place except by tree growth. Many soils with a slope of 12 per cent, or more, he said, should be retired from agricultural uses and allowed to reforest, or be planted to trees, where natural reforestation is not taking place.

Only reforestation, he said, would stop the devastating effects of erosion on a vast acreage of abandoned and gullied slopes of the state. In his life time he had seen hill lands cleared of forests, cultivated for a few years, abandoned to erosion and new lands cleared, only to be abandoned to erosion and other lands cleared. Three times this had occurred in his own observation.

Whether there is a law to prevent a land owner from allowing the washings of his gullied lands to fill up stream beds and cause overflows to ruin his neighbor's best lands on the stream below, he did not know, but if there was not, he believed a law should be enacted that would provide such protection.

Mr. Brown told of the work of extension foresters with farmers having forests or woodlots, of the cooperation of extension foresters with the Georgia Forest Service in carrying on service to timber owners and in forestry education. He spoke of moving pictures on forestry being displayed in public schools and felt that it was so well worth while that he was considering the purchase and use of additional moving picture equipment.

Following the address of Mr. Brown, President Woolford appointed committees.

At the luncheon, Judge Ogden Persons presided. Speakers introduced for brief remarks were: Col. Hyde Pratt, Chapel Hill, N. C., one of the founders of the association; W. T. Anderson, Macon; J. M. Mallory, Savannah; Richard W. Smith, Atlanta, State Geologist.

Indian Mounds in Georgia

An interesting diversion from the forestry discussions, was an address by Dr. C. A. Harrold, Macon, president of the Society for Georgia Archaeology, a new organization in the State with a number of enthusiastic members.

Of special interest was a report of the findings in recently excavated mounds near Macon, where the remains of a circular council chamber were uncovered. A clay replica of the foundation of the building was among the exhibits at the meeting. The new information revealed by the excavations, he said, was shedding light on the customs and habits of the Creek Indians and enriching Indian history.

Dr. Harrold said the Georgia Society for Archaeology was very much interested in finding the location of every mound in Georgia, and was particularly desirous that unopened mounds be reserved for the trained archaeologist to excavate, so that valuable information may be obtained that otherwise might be destroyed.

Robert Fechner Heard

The convention was honored by the presence of Robert Fechner, Washington, D. C., director of Civilian Conservation Corps work in forests and parks of the country. Mr. Fechner was born at Jackson, Georgia, and formerly resided at Augusta, and con-

siders Savannah as his Georgia home.

W. T. Anderson, Macon, presiding at the afternoon session of the convention, introduced Mr. Fechner as a Georgian engaged in a work designed to conserve young manhood and the forest resources of the nation, and characterized the CCC men as the "Army of Peace".

Mr. Fechner explained the inception of the CCC work as President Roosevelt's, in which he had in mind as a relief measure, the employment of idle and restless young men at useful and self-respecting labor in the forests of the country. The employment was in no sense a dole; it was not "made work", but a privilege for the young man to contribute something worth while for what they received from the government. That the contribution has been worth while is revealed by what has been accomplished.

No relief activity, he said, has met with greater public approval. While there were misgivings as to the efficiency of work by untrained men, many of them having no experience in manual labor, the records show that in a period of six months the boys had responded to an 80 per cent degree of efficiency, far exceeding the 30 per cent efficiency that some had predicted. They had shown that they were not loafers. Many of them are looking forward to devoting their lives to forestry work.

Mr. Fechner expressed a doubt as to industry absorbing all of these young men, and that they must be taken care of with work in forest parks, and on soil erosion. He hoped to see conservation work of this character given a permanent place in the activities of the government, and if members of the Georgia Forestry Association agreed with him, they should make their wishes known to members of Congress. He said that the states are financially unable to carry on the work and much that has been accomplished may be lost unless the federal government carries on the work to full completion.

One of the greatest assets of the CCC work, he said, had been the physical improvement of the men in the camps. This had been nothing short of marvelous. The physical benefits of the camp, he said, would be felt in good health for many years to come.

Mr. Fechner spoke highly of the efficiency of the four federal departments having the enrollment management and employment of the CCC men. Considering that it was a new and sudden demand, with multiplication of duties, he considered the response and the efficiency displayed to have surpassed anything hitherto displayed in the mobilization of men in this country. He said the organization of 300,000 young men was considered by many as a disguised movement for military purposes, but of course, he said, there were no ulterior motives. The men were given no military training. They were mobilized only as a relief measure to give men work, and for that alone.

He paid high tribute to the technicians

who planned the work in the forests and parks. One of the greatest joys of the work was to see discouraged, undernourished young men in a few days time with heads up and chests out, displaying a pride in being able to contribute to dependents back home, and saving them from being objects of public charity.

South's Timber Survey

The timber survey of the south now being conducted by the U. S. Forest Service, with Capt. I. F. Eldredge, New Orleans, in charge, was a matter of keen interest in view of the many inquiries now being made by paper mill interests. The association was favored in having Capt. Eldredge to tell it what the survey means and when the data will be available.

A large map was displayed, showing the south divided into districts; portions in green showed what had already been covered by surveying crews, and what portions of the districts remained to be covered.

Capt. Eldredge explained that the survey began in the southeast in the naval stores belt. When the data has been tabulated and studies made, he said, it would be possible not only to tell the number of existing crops of turpentine trees and potential yield, but determinations are made of the age and rate of growth of trees, so that it can be known what will be the potential yield for several years to come; also how much timber will be available for pulpwood, both through thinnings and the use of the turpentine trees. He explained how the survey was being made on strips ten miles apart, with terminations made at every 660 feet, following a direct course, no matter what the obstruction.

In a few months, the data which is being worked up by a large force at New Orleans will be available in the southeastern Georgia territory, and later for the entire lower section of Georgia. As soon as these areas are finished the crews will survey regions further north in the state, and if provisions are made for the continuance of the work, eventually the entire state will be covered.

Capt. Eldredge said he was constantly besieged by paper mill men for information as to the supply of pine timber in the south. Without anticipating the results of his survey, Capt. Eldredge said he had at one time made a survey of 57 miles through southeast Georgia and found enough pulpwood to more than supply the needs of the country for a year. He expressed himself as confident that the south can take care of the needs of the paper industry now, and indefinitely through sustained yields.

At the conclusion of Capt. Eldredge's address, the convention personnel was carried over the city to visit some of the justly famous private gardens, the Bobby Jones Golf Course, the business section of the city, and then to the famed Carmichael Club where a delightful barbecue was served, with the city of Augusta as host.

The Hon. M. H. H. Duvall presided in

the affable and witty manner for which he is famous, and brought about a renewal of the Duvall-Anderson feud by introducing W. T. Anderson, editor of the Macon Telegraph. The audience greatly enjoyed the repartee of the two. Robert Fechner of Washington, D. C., added to the pleasure of the occasion with remarks about his former connection and friends in Augusta. Judge Ogden Persons, Forsyth, also addressed the group, adding to the enjoyment of the occasion. Mrs. George Craig charmed the audience with her songs.

The second day's session opened with a business session, with President T. G. Woolford presiding. The election of officers and reports of committees appear further in this account.

Dr. Herty Enthuses Convention

"Pulp and Paper from Georgia Pines" was the subject of the address of Dr. Charles H. Herty, director of the pulp and paper laboratory at Savannah, who has shown that high quality newsprint paper can be made from southern pines.

Producing a sample of pulp, Dr. Herty said the south had gone practically broke raising cellulose in the form of cotton, but now it has an opportunity to grow and develop fine cellulose in the form of pine, a fibre 25 per cent longer than that in red spruce.

Dr. Herty reviewed the history of the pulp and paper research work in Georgia, told of discouragement when the state cut off its support; about his efforts to get the Tennessee Valley Authority's help, and finally of how the Chemical Foundation, Inc., came to save the day with money to run two years, or three, if necessary.

Dr. Herty then displayed pages of the Savannah Press printed on paper made solely from ground pine wood, and alongside, he showed the same pages printed on Swedish paper made of the usual combination of ground wood and sulphite pulp. He said the pine ground wood paper felted perfectly, and type and illustrations had come out clearly. While the ground wood paper was not a perfect paper, it compared favorably with that made of the combination of ground wood and sulphite. He thought a fine quality of paper could be made with a comparatively small amount of sulphite and thus reduce the cost of production to a low figure.

While paper authorities claimed southern pines would not felt properly, that claim had been conclusively disproved. No difficulty was experienced even where ground wood alone was used in making paper. Less chlorine, he said was necessary in bleaching southern pines than in bleaching red spruce. Ground loblolly pine, he said, was shown to be two grades lighter in color than red spruce.

Concerning experiments with the wood of turpented pines, he reported that it made as good paper as unchipped trees, in fact, contained no more resin above the chipped part of the trunk than an unchipped tree. He stated that there were

enough chipped pines standing today, 6, 7, and 8 inches in diameter, to supply 30,000,000 cords of pulp wood.

Dr. Herty reported progress in making bond paper from pine pulp, saying that the first run of such paper had been made, but only a crude product had thus far been obtained.

Referring to cost figures of paper making submitted to code authorities by paper mill men, he said that there was a differential in favor of southern pine paper of about \$20 per ton, that the south could manufacture and sell paper at \$40 per ton perpetually without the aid of a tariff, that all that is needed to bring this about is capital. He stated that all the information developed by the laboratory is free and open to anybody, and that many people are availing themselves of the offer.

Preliminary studies of the alpha cellulose of pines, he said, revealed that they contained a little more than red spruce, now generally used for making rayon and other cellulose products.

At the luncheon, Thomas J. Hamilton, editor of the Augusta Chronicle, presided and called upon C. N. Elliott, district forester, Augusta, to tell about the Gwinn Nixon state forest. H. L. Kayton, Savannah, naval stores leader, was introduced and took occasion to pay his respects to Bonnell Stone and Mrs. M. E. Judd as forestry pioneers in the State. Jack Williams, Waycross, Hon. William M. Lester, Hon. Ben Pierce of Augusta, were called upon for talks.

Vocational Foresters and CCC Men Hold Forth

The final session of the association was devoted to vocational foresters of the state and to CCC men. The session was presided over by B. M. Lufburrow, State Forester, who introduced Herman Braddy, Pavo, student winner of the Herty prize in 1933. Mr. Braddy told of his school and community work in the interest of forestry that won the prize for him. Among his activities were the issuing of an edition of a local newspaper, filled with articles on forestry; the broadcasting of a radio program on forestry, and pledging owners to prevent and fight fire. Mr. Braddy is now a forestry student at the University of Georgia.

On behalf of vocational agricultural teachers of the state, J. K. Callahan Wrens, expressed the sentiments of teachers regarding the school forestry project told of its popularity among the students and of the effect the training is having on the protection and improvements of forests.

P. L. Elkins, vocational teacher at Al pharetta in Fulton county, also spoke with favor about the forestry work in high schools, and told of how all his boys have home projects in forestry; of their collection and sale of tree seed, and extensive reforestation.

C. A. Whittle, educational manager of the Georgia Forest Service, was called upon and spoke briefly of the interest and enthu-

siasm displayed by the rural high schools concerning forestry work, and of the vocational forestry camp held each summer. The vocational teacher having the largest delegation to attend the meeting was R. B. Burt of Grard, in Burke county, with about 20 boys.

The remainder of the convention's program was given over to the CCC men. Representatives of two camps participated, that at Soperton and that one at Crawfordville. The programs consisted of talks, music, comedy, dancing, and was a most enjoyable occasion. It gave those present a conception of camp life that was a delightful revelation. Two CCC men spoke on what the camps meant to the enlisted men, Harry Williams of the Soperton camp and Mr. Hinkley of the Crawfordville camp.

The instrumental music and comedy skits of both camps was on a high order, but the scream of amusement was the "1934 CCC Follies," put on by the Crawfordville camp. Short skirts, bare backs, adornments and make-up, with up-to-now songs and dances, created a riot of fun.

Officers Elected

The list of officers elected by the Association are as follows:

President.....T. Guy Woolford, Atlanta
1st Vice Pres.....Jack Williams, Waycross
2nd Vice President..W. T. Anderson, Macon
3rd Vice President..Paul Chapman, Athens
Treasurer.....Jos. A. McCord, Sr., Atlanta
Secretary.....Bonnell Stone, Oxford

Executive Committee—Herbert L. Kayton, Savannah; Alex. K. Sessoms, Cogdell; J. M. Mallory, Savannah; J. A. Fowler, Soperton; R. E. Benedict, Brunswick; B. M. Lufburrow, Atlanta; Thomas Hamilton, Augusta; C. A. Whittle, Atlanta; Jim L. Gillis, Soperton; E. A. McCormick, Gainesville; E. George Butler, Savannah; Tom Candler, Blairsville; Dr. W. G. Lee, Macon; G. D. Marckworth, Athens; Judge Ogden Persons, Forsyth; Albert H. Marsh, Augusta; Mrs. T. H. McHatton, Athens; Mrs. Charles Center, College Park; Mr. J. S. Green, Butler.

Executive Committeemen and General Committee Chairmen—Farm Forestry—E. S. Center, Jr., Atlanta. Parks—Mrs. M. E. Judd, Dalton. Membership—Roland Turner, Atlanta. Statistics—W. H. Barnwell, Atlanta. Legislation—W. H. Key, Monticello. Co-operation—J. L. Rountree, Summit. Publicity—Miss Emily Woodward, Vienna. Markets—Gordon E. Reynolds, Albany. Research—Dr. Chas. H. Herty, Savannah. Industry—B. M. Lufburrow, Atlanta.

Resolutions

A resolution, endorsing the work of the Civilian Conservation Corps as a great boon to the nation, giving a great impetus to forestry and to conservation of both young manhood and national resources, was passed by the Georgia Forestry Association at its annual meeting, held at Augusta, Ga., May 10 and 11. It was therefore resolved to approve the continuance of CCC

work beyond the time now allotted, and ask that Congress so provide.

A resolution, thanking Robert Fechner for his address, his encouragement and the inspiration of his presence, was passed.

The Mayor of Augusta, the president and secretary of the Chamber of Commerce and other citizens of Augusta were thanked for their very fine hospitality.

A resolution praised the Kiwanis Clubs of Georgia for setting aside this year one program in the interest of forestry.

A resolution was passed thanking Cator Woolford, Atlanta, for his donation of San Domingo state park at the mouth of the Altamaha river; Ivan Allen, Atlanta, for his donation of a park site at Fort Mountain in Murray county; W. Y. Ledbetter, Rome, for his offer of a park site at Cloudland in Chattooga county, and various persons contributing to the enlargement of parks at Indian Springs, Crawfordville and Vogel parks and those contributing to the formation of the Pine Mountain Park.

Exhibits

A large number of interesting and instructive exhibits was on display in the convention hall. One of the most popular was a replica of the Alexander H. Stephens home at Crawfordville, made by the CCC men in camp there. It received much favorable comment. The Crawfordville camp also made a most commendable exhibit of wood samples. These were sought and obtained for a museum in Augusta.

The exhibit of the Georgia Archaeological Society, showing pictures of Indian mound excavations at Macon, with a replica of a council chamber uncovered, attracted much attention.

An exhibit made by Union county, showing photographs of a huge poplar tree that was 71 inches in diameter, with merchantable height of 84 feet, that cut out 10,155 board feet with a sale value of \$304.65. A statement on the exhibit claimed it was the largest tree ever cut in Georgia of which there is any authentic record.

Other exhibits were panels by the Georgia Forest Service, charts and literature by the School of Forestry of the University of Georgia; a collection of minerals by the Georgia Geological Survey; Hercules Powder Company's steam naval stores products; the Caterpillar Tractor Company; Southern States Iron Roofing Company, of naval stores equipment; the Piedmont Company, wood products; a roll of newsprint paper made from Richmond county pines.

Dr. Chas. H. Herty made an exhibit of several samples of paper and publications to illustrate his address, and allowed the audience to take them after he had spoken.

But even if the Stock Exchange should be closed, people who like to gamble can still buy second-hand cars.—Southern Lumberman.

REPLICA STEPHENS HOME STATE MUSEUM AT CAPITOL

Made by CCC Men at Crawfordville — Exact Reproduction of Home of Great Statesman

A miniature reproduction of the home of Alexander H. Stephens, the great statesman and vice president of the Confederacy, is now on display in the museum on the fourth floor of the State Capitol. This contribution was made by the CCC men at work on the Alexander H. Stephens Memorial park at Crawfordville, who have not only repaired the Stephens home, but are making a beautiful park in the surrounding area.

The replica was made for exhibition at the annual meeting of the Georgia Forestry Association at Augusta, May 10 and 11. There it attracted so much favorable attention and so many were the expressions favorable to placing it in the State Museum, that it was brought to the State Capitol and installed in an alcove on the fourth floor.

The men who had a part in the actual construction of the building, which is on a base 7 by 8 feet in size, and entailed a great amount of detail work were Tom DeVore, foreman; William Cuniff, Max Lawless, Rolton Stallings, Stephen Blair, James Sumner and Russell Norris. W. W. Clark, camp forester, had general supervision of the work.

NATIONAL FOREST PURCHASES IN SOUTHERN APPALACHIANS

The National Forest Reservation Commission has authorized the purchase of 762,186 acres of forest land in the southern Appalachians, of which 658,000 constitutes a new national forest to be known as the Clinch Unit, located on the head waters of Clinch river in southwest Virginia. The remaining acres of the purchase are to be attached to the existing Unaka, Nantahala, Cherokee and Pisgah national forests.

ACID TREATMENT LOCUST SEED HELPS GERMINATION

The hard coating of locust seed makes for slow germination. The Southern Forest Experiment Station, New Orleans, recommends sixty minute soaking of thoroughly dry seed in concentrated acid (1.84 specific gravity), stirring lightly. They should then be drained, recovering the acid for future use. Then they should be thoroughly washed in a stream of cool water, using large amounts to counteract the heating caused by mixing acid and water. The washing should continue five or ten minutes or until the seed are thoroughly rinsed of acid. The treated seed should then be spread out in a thin layer in a shady place to dry.

FIRST DISTRICT

**Russell Franklin, Dist. Forester
Rome**

CCC News

Camp P-77 located at Tate, Georgia, has been scheduled to move for the past few weeks, but is at work as usual on TPO land in Pickens county. The camp has recently completed a connecting road to Conahaynee Lodge which leads to the highway from Tate to Dawsonville. This road is of great value from a protection standpoint, as it opens up a large area of fire hazard. Work has also been started on a new road from the camp to the highway. This road will be of inestimable value to the TPO, as it runs through an area where most of the fires have occurred in past years. The roof on the second lookout tower is being completed. These towers are masterpieces of construction from an aesthetic as well as a sturdy construction viewpoint.

Camp SP-6 at Ellijay, Ga., has started work on the road going to the park on top of Fort Mountain. The side camp on Rich Mountain reports that the lookout tower is nearing completion. Some trouble was had in breaking in mules to pack lumber with a Forest Service pack saddle. The problem was finally solved by making a lumber buggy out of two wheelbarrow wheels. The lumber is now transported behind the mules.

Fire Equipment at Alpharetta

Members of the FFF in the old Milton county section of Fulton county are contemplating buying six more fire pumps before next fall. Mr. P. L. Elkins, vocational teacher at Alpharetta, is doing some valuable work in this connection. Mr. Elkins made a fine talk at the annual meeting of the Georgia Forestry Association at Augusta. He is a prominent contestant for the Herty prize for vocational teachers. This prize is offered by the Georgia Forestry Association.

THIRD DISTRICT

**C. N. Elliott, District Forester
Augusta**

School Visits

Last month, Mr. C. A. Whittle, educational manager of the Department of Forestry and Geological Development, was in Augusta for the purpose of visiting the schools in the Augusta district. With the district forester contacts were made at Wrens, Vidette, Girard, Washington, Tignall and Nancy Hart Memorial schools. One of the primary reasons for visits to these schools was to invite the teachers and pupils who are studying vocational forestry to attend and participate in the 13th annual meeting of the Georgia Forestry Association which was held in Augusta on May 10 and 11.

Dr. Harrold Explores Mound

An interesting controversy has arisen over Whites mound which lies below Tahoma station in the Savannah river swamp. Tahoma station was once known as Hollywood, and the entire section of the swamp below it was known as Hollywood swamp. The present Whites mound is thought to have been once known as Hollywood mound but no definite proof has been established. Recently, Dr. C. C. Harrold, President of the Society for Georgia Archaeology, visited Augusta in an effort to locate Hollywood mound. He studied White mound in detail but was unable to determine whether or not this is the same famous mound which was once known as Hollywood mound.

New TPO

Interest in the formation of a new timber protective organization has been manifested in the Windsor Spring section of Richmond county. The Windsor Spring and Cole estates comprise an area of approximately 12,000 acres, most of which is timber and young growth. Plans for the organization are being formulated.

Bird Talks

The district forester has gone out of his natural element recently and made talks at several of the Augusta schools, on birds. This was to stimulate interest in a prize offered by the Augusta Herald for the best essay on "Why I Should be a Neighbor to Birds?" Much interest has been shown in this subject by the school children of Augusta.

FOURTH DISTRICT

**W. G. Wallace, District Forester
Columbus**

Causes of Forest Fires in the Columbus District

The following data on forest fire causes, while not conclusive, are at least indicative of where the blame should be placed for the origin of forest fires. The data is taken from the combined reports of both P-56, Warm Springs, and P-78, Butler, and covers the period from January 1st to April 30th. Each fire is tabulated according to cause, acreage burned, and month of occurrence. It includes all fires suppressed by the two C. C. C. camps and are fires which occurred both on and off T. P. O. areas. I feel that the January-April period can be considered the most intensive fire season in this district.

The following is a summary of the causes of fires, giving the percentage of the total number of fires due to each cause, and percentage of total area burned by causes:

	Per Cent. Total Fires	Per Cent. Total Acres Burned
Brush burners*	35	22
Incendiary	16	18
Railroads	6	20
Hunters & Campers	2	1

Miscellaneous	10	9
Unknown	31	30
Total	100	100

*Fires originating from farmers burning fields and woods preparatory to farming operations, etc.

The most significant indication from the above summary seems to be that the farmers, both tenant and those owning the land, cause the most forest fires of known causes to burn over the greatest acreage of forest land. The fires of unknown origin could be pro-rated among the known causes, I think, with fairness. Incendiary fires, those set with malicious intent, are second as to the number of fires.

It is interesting to note that although the railroads caused a comparatively small number of fires, these fires burned over a comparatively large percentage of the total area burned. These all occurred in Taylor county during April when very hazardous fire conditions existed. This was also in a widely timbered area.

That it is still a matter of at least fifty per cent. education combined with proper prevention and suppression preparedness, and the proper degree of law enforcement. The patrol type of fire protection, with the further assistance of lookouts, and fire-fighting equipment and personnel, plus the cooperation of all people aware of the damage of forest fires, we should be able to make rapid strides towards correcting the present forest fire condition.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Vocational School News

Visits were made by the district forester to all the vocational schools in this district that have forestry projects. Demonstrations were given in tree identification, estimating standing timber, fire protection and uses of woods.

The Emanuel County Institute at Graymont, with Mr. Tanner as Vocational Teacher has accomplished more on its forestry project than any other school in this district. The school has constructed fire breaks, measured and recorded the diameters of their two one-quarter acre plots, one to be burned and the other not burned, to compare diameter growth on burned and unburned land. It has made improvement cuttings, removing dead and undesirable species, and improving its stand of timber. Every boy taking vocational work has a home project and has done protection work, planting and thinning on these home projects.

Swainsboro Side Camp

A side camp has been approved by the U. S. Forest Service for Swainsboro and final approval on the site will be handled by the army and as soon as their approval is given, camp construction will begin.

(Continued on Page 8, Col. 2)

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

OLIVINE AS A BASIC REFRACTORY

By

RICHARD W. SMITH, *State Geologist*

Olivine is a transparent to translucent mineral, named for its olive-green color, usually occurring in granular aggregates or as small disseminated glassy grains. It is a silicate of iron and magnesium, $2(\text{Mg,Fe})\text{O} \cdot \text{SiO}_2$, with varying amounts of iron and magnesium, the magnesium usually being far in excess of the iron. It is found in nearly all basic (as opposed to granitic or acidic) igneous rocks. It is the principal constituent of the ultra-basic rock **dunite**, which usually includes small amounts of chromite, magnetite, and enstatite. Dunite is found in Georgia and in North and South Carolina as dikes and irregular intrusions varying in size from a few feet to nearly a mile across. It is one of the rocks which gives rise to the alteration products: corundum, vermiculite, chromite, asbestos, talc, chlorite, serpentine, and soapstone; although these products often are derived from the alteration of other basic rocks.

Bricks made from magnesite, the magnesium carbonate MgCO_3 , have long been used in the steel industry and elsewhere in cases where a basic refractory would give the best service. The only domestic magnesite deposits are on the west coast, whereas most of the consumption is in the east. This has resulted in about a third of the magnesite consumed in the United States being imported from abroad. For the last year or two some thought has been given to the possibility of using olivine as a substitute for magnesite. Several tons are said to have been mined from near Balsam Gap, North Carolina, and successfully used as a refractory for a basic open-hearth steel furnace.

The United States Bureau of Standards has recently made a preliminary investigation on the properties of olivine in view of its use as a refractory.*

Three samples from North Carolina, one from California, one from British Columbia, and one from Russia were tested, together with a sample of calcined magnesite. The authors found that the rate of thermal expansion was fairly regular from room temperatures to 900°C . except for slight irregularities between 200° and 300°C ., and again between 650° and

700°C ., approximately. The total expansion ranged from 0.942 to 1.082 per cent and is somewhat lower than that of magnesite. The pyrometric (cone equivalent (softening point) of the raw ore ranged from Cone 30 to above Cone 35, with those from North Carolina all above Cone 35 (approximately 1785°C . or 3245°F .). The results indicated that the material from North Carolina was sufficiently refractory to high temperatures and certain types of slag to warrant its use as a special refractory. Brick were easily made from run-of-mine material and proved satisfactory in the few physical tests to which they were subjected.

Dunite composed of nearly pure olivine has been noted in Rabun, Towns, and Troup counties in Georgia, although it is possible for it to occur anywhere in the Piedmont and Mountain sections of Georgia. It is especially likely to be found in the belt containing numerous peridotite intrusions that extends across Georgia from Troup and Harris counties northeast to Rabun county and on into North Carolina, the area once known as the "corundum belt" because of the numerous corundum deposits associated with these basic rocks. All except two of the following localities are taken from descriptions in Bulletin 2, "Corundum Deposits of Georgia," by F. P. King, and Bulletin 29, "Asbestos, Talc and Soapstone Deposits of Georgia," by O. B. Hopkins, both published by this department. No investigation has yet been made to determine the size of these deposits or the quality of the material.

Known Olivine-Dunite Deposits in Georgia

Rabun County: (1) County road quarry on the Clayton-Hiawassee Highway, $13\frac{1}{2}$ miles west of Clayton; (2) Laurel Creek Corundum Mine near Pine Mountain, 15 miles east of Clayton; (3) Old Hicks Asbestos Mine, Land Lot 81, 3rd. District, northeast of the Laurel Creek Mine; (4) A. A. Darnell property, Land Lot 156, 2nd. District, 5 miles west of Dillard's on Betty Creek; and (5) R. H. Lamb property, Land Lot 188, 2nd. District, 4 miles northwest of Dillard's near Betty Creek.

Towns County: (1) Hog Creek Corundum Mine, Land Lot 92, 17th. District, 2 miles west of Hiawassee; (2) Chromite prospect on Bell Creek, north of Hiawassee.

Troup County: Chromite prospect near Louise.

The demand for olivine is not as yet sufficient to determine its value per ton. Considerable research will have to be made

to determine to what extent it can be used as a substitute for magnesite or other materials in the manufacture of refractory bricks and plastic refractories and cements. Georgians should, however, keep in mind this possible demand, and should be on the watch for additional deposits. Any massive and granular olive-green rock should be sent in to the State Geologist, 425 State Capitol, Atlanta, Georgia, for determination.

FEDERAL GEOLOGISTS HOLD FIELD CONFERENCE AT DAHLONEGA

People of Dahlonega, Georgia, have always regarded geologists as those peculiar men whom capitalists often insist on having examine and report on a gold mine before they will finance it. One or two at a time are frequently seen around Dahlonega, but never in the recollection of the oldest inhabitant have so many geologists been seen together as gathered there on May 3rd and 4th. The occasion was a field conference of the geologists investigating the gold deposits of North and South Carolina, Georgia, and Alabama under Public Works Funds for the United States Geological Survey.

The party which gathered at Smith House on the night of May 2nd included the following geologists: Dr. G. R. Mansfield, Chief of the Non-Metallic Section of the United States Geological Survey; H. G. Ferguson, Acting Chief of the Metallic Section of the U. S. G. S.; D. W. Johnston, Jr., in charge of the gold investigations in the Southern Appalachian region; J. Volney Lewis and J. T. Pardee, who are making the gold investigations in North and South Carolina; C. F. Park and E. W. Ellsworth who are making the gold investigations in Alabama; and R. A. Wilson and W. C. Hansard who are making the gold investigations in Georgia; and Richard W. Smith, State Geologist.

The first day was spent in studying the saprolite and vein deposits along Findley Ridge. On the second day the party visited the underground mine of the Southern Minerals Development Co., near Auraria, the hydraulic operations and mill of the Topabri Co., near Auraria, and the stream placer mine of the Dixie Gold Mining Co. on Boggs Branch. On Saturday morning, May 5th, part of the party headed for Alabama to visit a gold mine. The rest of the party, including Mansfield, Lewis, Pardee, Ellsworth, and State Geologist Smith visited the kyanite mine of the Georgia-Carolina Minerals Corporation northwest of Clarksville in Habersham county and a vermiculite mine just across the North Carolina line from Rabun county.

*Heindl, R. A., and Pendergast, W. L., Olivine as a refractory: U. S. Bur. Standards, Research Paper No. RP645, Feb., 1934.

SEVENTH DISTRICT

C. B. Beale, District Forester Waycross

District Seven has been subdivided into 13 areas, each area to be developed as a

T. P. O. with a paid secretary-manager in each area to develop more intensified protection and to better carry out the aims of the Georgia Forest Service.

The T. P. O. areas, with headquarters are are follows:

Area	Location	Headquarters	Name of T. P. O.
A	Ben Hill-Irwin Cos.	Ocilla	
*B	Coffee-Jeff Davis northern Atkinson Cos.	Douglas	Ben Hill-Irwin
*C	Appling Co.	Baxley	Coffee-Jeff Davis
*D	Wayne Co.	Jesup	Appling
E	Bacon-Pierce-N. Ware Cos.	Crawley	Wayne
*F	Brantley Co.	Nahunta	Hurricane Creek
G	Glynn Co.	Brunswick	Brantley
*H	Camden Co.	Woodbine	Brunswick-Penn.
*J	Charlton Co.	Folkston	Camden
*K	Clinch, So. Atkinson, Ware, W. Lanier Cos.	Homerville	Charlton
*L	Echols Co.	Fargo	Consolidated
*M	Berrien-Cook Cos.	Nashville	Suwanee River
N	Lowndes-Lanier Cos.	Valdosta	Berrien-Cook
			Grand Bay

*—Denotes fully organized with paid secretary-manager.

*—Denotes fully organized but without paid secretary-manager.

Others are organized but not developed as yet.

Meetings have been held at each area headquarters this month for the purpose of deciding on policies and objectives for the fiscal year 1935. While fire protective measures are inadequate on most areas, four of them have 100% tower systems now, and the 1935 budgets of three others call for a complete tower system. It is expected that by fall all the areas will be fully organized and well on the way towards development and more intensive fire protection.

There are to date almost two million acres signed up in the T. P. O.s in this district, a large percentage of which is active. The Consolidated T. P. O. of Homerville, in area K is the largest, with 500,000 acres signed up.

Several of the T. P. O.s are planning to purchase a number of specially equipped fire trucks to be located at strategic points in the area, with some one well trained in fire fighting employed to drive and care for them during the fire season.

ECW Items

When Gov. Eugene Talmadge sent a telegram of congratulations to P-52 Homerville, for ranking the best camp in Georgia, there was due cause of celebration among its personnel. Capt. Hugh Dudley and Supt. "Cocky" Browne worked hard to gain this recognition, and rightly deserve the honor given them. They made 599 points out of a possible 600 for technical service. The keynote of their success is 100 per cent cooperation between the Army and the Forest Service. One is impressed with upon visiting the champion camp in Georgia, here in reality is southern hospitality at its best.

P-59—Fargo

Details for the establishment of a side camp from P-59, Fargo, at Haylow, thirty miles away on the west side of the TPO, will have men in it when this issue of the Forestry-Geological Review goes to press. Supt. Myers soberly declares that "We're going to show them something now, with a new tractor and grader and the travel distance to the west side of the area cut down by the side camp."

Side camps will also be established at Pearson from base camp P-52, Homerville, and one on Cumberland Island from base camp P-60, Colesburg, at an early date.

P-72—Waycross

Supt. Martin and his engineers are busy locating lands of the Crawley TPO in northern Ware county, and laying out a system of fire breaks to construct in that area.

Sixth District

(Continued from Page 6, Col. 3)

This side camp is being established to do work on lands listed in the Emanuel T. P. O. which was organized in 1931, and contains some 35,000 acres.

The Camp P-61, at Soperton, will be the base for a Swainsboro side camp.

T. P. O. Meetings

Meetings will be held by Ogeechee, Treutlen and Tar City T. P. O.'s, at which time the budgets and work plans for the fiscal year 1934 to 1935 will be drawn up. Mr. Elliott Reed, of Savannah, is president of the Ogeechee T. P. O., which embraces land in Chatham and Bryan counties. Mr. M. V. Overstreet, of Manassas, is president

MINERAL EXHIBIT GOES TO CHICAGO EXPOSITION

An exhibit of minerals from Georgia furnished by the Division of Geology will have a prominent place in the Georgia Exhibit at the Century of Progress Exposition at Chicago which reopens on May 26th. The principal feature of the display will be the gold nuggets and semi-precious stones which attracted so much attention last year. In addition, 310 specimens representing over 70 different minerals and rocks found in Georgia have been selected from the State Museum by State Geologist Richard W. Smith and packed by Mr. A. M. Turner. New cases for their display have been designed by Mr. V. M. Shepard who has charge of setting up the Georgia exhibit.

This is not Mr. Turner's first experience in packing a mineral exhibit for national expositions. He has served as clerk and museum assistant under former State Geologists Yates and McCallie. In 1907 he assisted in packing and setting up the Georgia exhibit at the Jamestown Exposition, and in 1914 he was in charge of the Georgia exhibit at the Southern Exposition in New York City.

New Assistant State Geologist,

Lane Mitchell, Appointed

The Division of Geology announces the appointment, effective June 1st, of Mr. Lane Mitchell, of Atlanta, as Assistant State Geologist. Mr. Mitchell graduated in Ceramic Engineering from the Georgia School of Technology in 1929. As an undergraduate at Georgia Tech he assisted State Geologist Richard W. Smith in testing the sedimentary kaolins of Georgia, the results of which were published in Bulletin 44 of the Georgia Geological Survey. Mr. Mitchell continued his studies at the University of Illinois, specializing in geology, chemistry, and ceramics; followed by a research fellowship at Rutgers University in New Jersey.

Mr. Mitchell's first work with the Division of Geology will be in revising the economic geology exhibits in the State Museum, and in preparing a series of mineral exhibits for the high schools of the state. The force of the Division of Geology now consists of Richard W. Smith, State Geologist; G. W. Crickmay, Assistant State Geologist, on leave of absence until September 1st; Lane Mitchell, Assistant State Geologist; Miss Margaret Gann, Secretary and Clerk.

of the Tar City T. P. O., which embraces lands in Central Tattnall county. Mr. Jin L. Gillis, of Soperton, is president of the Treutlen T. P. O., which contains nearly all the forest land in the county.



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VOCATIONAL FORESTRY CAMP HELD JULY 16 TO AUGUST 4

Fourth Annual School Camp at Baldwin College, Tifton, to Study South Georgia Forests—Excursions Include Seacoast

The fourth annual vocational forestry camp will be held this year July 16 to August 4 at Abraham Baldwin Agricultural College, Tifton, where an opportunity will be given to study south Georgia forests. The three previous sessions were held in the mountains of north Georgia.

One hundred students from rural consolidated high schools having vocational agricultural teachers, will take courses in practical farm forestry. Half of this number has already had three weeks camp work, and on the successful completion of six weeks camp work, they will receive a certificate of vocational forester that recommends them for non-technical forestry work. Two classes have already received such certificates, and several of the young men are engaged in forestry work.

The facilities of both Baldwin College and the Coastal Plain Experiment Station are available for field work, likewise some areas nearby that are producing naval stores.

Excursions are to be made to study forest conditions in that part of the state. Week-end trips include visits to St. Simons on the Coast and to Radium Springs near Albany.

The students attending the camp have won camp scholarships in their respective schools by standing a competitive examination in forestry, by having home projects in forestry, by having high general scholarships and good moral character. All have had work in forestry under their vocational agricultural teachers, who have used school forests for practice. The management plans for these forests have been made by representatives of the Georgia Forest Service, who conduct forestry demonstrations at the schools two or more times each year.

The camp is conducted jointly by the Georgia Forest Service and the State Department of vocational agricultural education, the expenses being paid and the instruction given by the Georgia Forest Service.

(Continued on Page 2, Col. 1)

PRESIDENT ROOSEVELT FAVORS SOUTHERN PAPER MILLS

Rousing Protest Against Policy that Would Favor Foreign Pro- ducers and Discourage Erection of Paper Mills in the South

The thesis of Dr. Mordecai Ezekiel, Washington official, against erecting new paper mills in this country in order to protect export balances, has been stricken from the administration's Gospel of the New Deal, thereby confirming a biblical statement that a prophet is not without honor save in his own country.

A furore was raised in the South when Ezekiel's proposition became known. Newspaper interests, paper mill manufacturers, timberland owners, congressmen, foresters were up in arms against any proposition that would discourage the paper production independence of this country. The South protested most vigorously, because as the result of experiments and demonstrations of Dr. Chas. H. Herty, southern pines are well suited to making paper, and it is held that there is enough pulpwood in the south to meet the entire paper needs of this country now and through sustained yields, all the country's demands of the future, and provide it more cheaply than it is now being obtained from foreign sources.

The net results of the tempest is the assurance of President Roosevelt that nothing adverse to the development of paper mills in the south will be permitted.

CYPRESS KNEE

The twelfth annual edition of the Cypress Knee, an annual issued by the Forestry Club of the University of Georgia, has appeared, this time in attractive imitation wood covers.

The publication is praiseworthy in every particular. Very fittingly, a memorial to Dr. Andrew M. Soule, founder of the School of Forestry, appears on the front pages. Excellent articles, beautifully illustrated, sepia paper, brown ink, good typography, are features of the publication.

Of course the publication contains sketches and pictures of the graduating foresters. A fine, intelligent bunch of men they are, ready to take up their profession, and doubtless will reflect credit on their alma mater.

STILL LONGER LONGLEAF PINE NEEDLES REPORTED

The Apparently Superior Pines Suggest Propagation of Planting Stock from the Seed

District Forester H. D. Story, Jr., Albany, Ga., has sent to the headquarters of the Georgia Forest Service longleaf pine needles found near Sylvester, Ga., that measure 31 9-16 inches in length. W. D. Martin, vocational agricultural teacher, had previously sent in needles from the same vicinity that measures 26 to 27 inches in length. An account of this with a challenge for any to report longer needles brought only one response, and that is reported above. The longer needles are from the same grove of about 5 acres from which the first samples were reported.

District Forester Story reports that the whole stand will show an average needle length of 20 to 24 inches. The trees are about 25 years old.

Such long needles suggest their splendid adaptability to weaving pine needle baskets and various articles, both useful and ornamental. Long, vigorous needles also suggest the possibility of large yields of gum from such trees.

In selecting seed for planting purposes, this long needle variety would seem to offer advantages, just as seed selected from superior farm crops give better yields.

EXPERIMENTAL FOREST AREA ON CHEROKEE FOREST

One of the eight new experimental forests selected by the U. S. Forest Service is located in Georgia on the Toccoa river basin not far from Blue Ridge. The area is 2,315 acres and is taken from the Cherokee National Forest.

Other experimental areas in the south are 4,300 acres of the Nantahala National Forest in North Carolina; 2,500 acres of the Ozark National Forest, Arkansas; 3,280 acres of the Osceola National Forest, Florida.

It is stated that the eight experimental forests are designed to provide regional information on problems of timber growing, watershed protection, erosion control, etc.

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Vocational Forestry Camp

Held July 16 to August 4

(Continued from Page 1)

ice, while the management of the camp and transportation is handled by the vocational teaching department. Seven to ten vocational agricultural teachers attend the camp each year.

The courses of study in the camp consist of (a) Tree Identification, (b) Forest Management, which includes collecting and care of tree seed, growing planting stock, planting trees, fire protection, thinning, improvement cutting and harvesting and marketing. (c) Mensuration, which includes surveying, estimating the volume of standing timber, mapping, log and lumber measurement and (d) Wood Utilization.

This year special attention will be given to field studies of naval stores production. The students listed to attend the camp this year are as follows:

Second year Students: Billie Garrett, Butler; Farris Carlan, Homer; Robert Smith, Lorane; Ralph Johnson, Winder; J. W. Donalson, Jr., Register; Barron Cochran, Girard; Render Rowe, Carrollton; Homer Winkle, Armuchee; Robt. Poteete, Kennesaw; Elmon Vickers, Norman Park; Ashley Whitehurst, Adel; Jim Hulsey, Dawsonville; Chas. Head, Chamblee; Charlie Gunn, Vienna; Paul Jones, Middleton; Calvin Ellington, Summit; Howard Tatum, Dawsonville; John Broadwell, Alpharetta; Bill Oliver, Martin; Woodrow Osborn, Ellijay; Harrell Russell, Calhoun; Quinton

Rooks, Dacula; Eugene English, Demorest; Dorsey King, Lavonia; Solon Owensby, Franklin; Teney Hardwick Floyd, Ocilla; Oliver C. Anderson, Matthews; Elton Riner, Kite; Edwin Lloyd, Stockton; Virgiree Coleman, Plainfield; Alton Hodges, Ludowici; O. M. Cates, Jr., Meigs; Huie Brand O'Kelly, Danielsville; Holland Tuck, Oxford; Paul Roby, Rabun Gap; J. H. Holloman, Richland; Perry Foster, Jr., Leslie; Cecil Parks, Howard; Tharon Connell, Pavo; Russell Willis, Ty Ty; Wilber Blount, Vidalia; Shad Calloway, Hogansville; Austin Avery, Adrian; J. L. Spence, Waresboro; Dock Akin, Screven; Paul Rees, Preston; Tom Strickland, Dalton; Lee Sisson, Rayle; I. J. Medders, Sylvester; Keith Barnett, Bogart; Sam Loyd Whitmire, Eastanollee.

First Year Students: Buell Carlan, Commerce; James Jackson, Winder; Lehman Dekle, Register; King Godbee, Jr., Girard; Charles Lowry, Gore; Ellis Vinson, Meigs; Maurice Barton, Adel; Howell Wheelchel, Gainesville; John Henry Donalson, Doraville; Rabun Gaines, Bowman; Edwin Drake, Adrian; Woodrow Ensley, Epworth; Jim Tatum, Alpharetta; George Brown, Carnesville; Charlie Burgess, Ellijay; Glenn Fox, Calhoun; Tom Sawyer, Lawrenceville; Virgil Wellborn, Clarksville; C. B. Chapman, Hartwell; John Miller, Franklin; James Harden, Ocilla; Olin Seabolt, Commerce; Milford Jackson, Matthews; Cecil Attaway, Wrightville; I. B. Kirkland, Stockton; George Westbrook, Cadwell; Wysor Earl Floyd, Ludowici; Joe Gandy, Pelham; Johnnie Ross Freeman, Danielsville; Ray Neal, Rabun Gap; Frank Downer, Richland; Henry Williams, Plains; Edward Rustin, Mauk; H. A. McKibben, Pavo; Brooks Brantley, Vidalia; Franklin Perkins, Hoganville; Oswell Smith, Waresboro; Carlyle Green, Screven; Dreyfus Fountain, Ft. Valley; Charlie Hair, Dalton; Hugh Lewis, Washington; Dewey Medders, Sylvester; Charlie Jones, Rockingham; W. R. Roberts, Nashville; John Thomas Pittard, Winterville; Loyd Poitevint, Camilla; Lonnie Tabb, Colquitt; Scott Walters, Gore.

Damping Off Disease

Of Tree Nursery Beds

According to observations reported by George S. Barry in **Service Letter** (Pa.), young coniferous seedlings in nursery beds suffered most from damping-off where the soil is least acid and least where the soil is highly acid. This conclusion is reached after several years of observation.

Pine and Cherry Natural Graft

The Alabama Forest News reports an unusual natural grafting in three places of a shortleaf pine and wild cherry growing side by side. The remarkable fact is that two such widely different species have made vital contacts. The trees are growing near Grove Hill, Alabama.

GRAZED CARPET GRASS FOR FOREST FIREBREAKS

Elsewhere in this issue is an account of carpet grass being sown on firebreaks as a means of maintaining their efficiency without annual plowing and at the same time providing grazing.

The degree of efficiency of the carpet grass firebreak depends on the closeness of grazing. For nine or more months in the year carpet grass remains green and is therefore a natural firebreak. If it is allowed to come to seed, the grass will have a light combustible growth standing above the grassy mat, sufficient to carry fire. If grazed closely, this menace is removed. But the effectiveness of the carpet grass firebreak also depends in a measure on how close the grazing as to how much of a mat of carpet grass remains for carrying a ground fire.

There seems to be no doubt that carpet grass is an effective firebreak while it is green, and that when not green, if it has been grazed closely, it will so impede the progress of a fire, if it does not stop it, as to make the fire easy to control.

The arguments in favor of the carpet grass firebreak are that it introduces livestock as an aid to the carrying charges of forest lands; better and longer grazing is afforded than is provided by wire and sedge grass, common to pine forests of the Coastal Plain; in addition, there is the encouragement that grazing gives to establish wider than usual firebreaks.

Carpet grass seed should be sown on firm soil. A firebreak plowed in the fall should not be replowed in February for the sowing of carpet grass seed. If the ground is then weedy, it should be burned off and the seed sown on the surface of the ground. Rolling the seed in with a log, or lightly scratching the surface with a brush brings the seed into better contact with the soil and improves germination.

Of course carpet grass is suited especially to low, moist soils; it does fairly well on slopes, but is not suited to coarse, sandy soils of sandy hills. On low, moist soils of lower Georgia, carpet grass remains green the year round; on higher and less moist soil, the grass will be partially green or dead for two to three months, especially in the upper coastal plain. Carpet grass has done fairly well in the lower piedmont area of the state, but is not well suited to the upper half of the piedmont area or to any part of the state further north.

Once seeded, carpet grass perpetuates itself without annual reseeding.

Some Whoppers

The Forest Log, Salem, Oregon, reports a giant tree age 432 years, with a production of 20,000 board feet.

A logging camp at Montesano, Washington, cut a spruce that measured 12 feet in diameter at the base and scaled 47,200 board feet.

SUMMARY C. C. C. WORK UNDER GA. FOREST SERVICE

A summary of CCC work accomplished under the Georgia Forest Service for the month of May and cumulative report till June 1, is as follows:

Average number camp workers per month, 128.
Telephone lines, May, 35 miles.
Total telephone lines, 633 miles.
Firebreaks, May, 255 miles.
Total firebreaks to June, 2,944 miles.
Fire hazard reduction, May, 215 miles.
Total fire hazard reduction to June, 2,615 miles.
Roadside trails cleared, May, 33.2 miles.
Total roadside trails cleared, to June, 477.6 miles.
Lookout houses, May, None.
Total lookout houses, 4.
Lookout towers constructed, May, 2.
Total lookout towers constructed to June, 32.
Man days fire fighting, May, 833.
Total man days fire fighting, to June, 28,294.
Truck trails constructed, May, 37.4 miles.
Total truck trails constructed, to June, 460 miles.
Maintained truck trails, May, 40.2 miles.
Total maintained truck trails, 588.4 miles.
Foot and horse trails, May, 15.7 miles.
Total foot and horse trails, 129 miles.
Permanent bridges, May, 2.
Total permanent bridges, 16.
Area type-mapped, May, 266.690 acres.
Total area type-mapped, to June, 2,206,981 acres.
Line surveys, May, 326.3 miles.
Total line surveys to June, 1,513 miles.
Number bridges constructed, May, 69.
Total number bridges constructed, to June, 817.
Acres landscaped on parks, May, .5 acres.
Total acres landscaped, to June, 3.5 acres.

STEPHENS FOLIO PLAQUE

The CCC Camp at Crawfordville has not only constructed a model of the Alexander H. Stephens home at Crawfordville good enough to find a place in the State Museum, but clever workers in the camp have provided a unique sign to go with the model. The sign is made from ash hewn to the shape of a large open book. On the left page is a statement explaining the building, and on the other page the fact that it is made by the CCC camp at Crawfordville.

The lettering is burned into the wood; likewise the imitation folios of the book, binding and cover. The plaque reflects much credit on its makers, both for its artistic execution and for its unique design.

Born to Mr. and Mrs. W. G. Wallace, Theresa Ann Wallace, May 2. Mr. Wallace is district forester with headquarters at Columbus.

PROGRESS SOUTHERN FOREST SURVEY

The Southern Forest Survey expects to complete the survey of approximately 47 million acres of land in the active naval-stores belt of South Carolina, Georgia, Florida, Alabama, and Mississippi by the end of the present naval-stores year (before March 31, 1935).

The object of this survey is threefold: (1) to give the present inventory of standing timber suitable for naval-stores operation, for pulpwood, poles, posts, ties, and other wood products; (2) to ascertain the rate at which the supply of timber suitable for each of these uses is being increased through natural growth; and (3) to determine the rate at which the supply of timber in these stands is being depleted through industrial and other uses. Reliable data on these three phases of the survey work will make possible the formulation of a rational plan of land and timber management.

Field work on the timber inventory is being done by 12 crews, each made up of 1 experienced timber cruiser and 2 assistants. These crews are systematically grid-ironing the entire naval-stores belt, and, on 1-4 acre sample plots, are carefully measuring trees and recording data on the timber stand, its use for naval-stores production, etc. Specialists on timber growth and timber depletion are assigned to special growth and depletion studies. Prior to May 1, the field inventory had been made on approximately 16 million acres of land in the naval stores belt.

Inventory work on the Southern Forest Survey is also under way on land under the jurisdiction of the Tennessee Valley Authority in Tennessee and Virginia. Approximately 1-2-million acres were surveyed prior to May 1. Field work completed in the bottomland hardwood region of Mississippi and Louisiana and the shortleaf-loblolly pine uplands of Mississippi aggregates approximately 17 1-2 million acres, making a total of 34 million acres already surveyed.—Southern Forestry Experiment Station.

Woodpeckers Help

Woodpeckers last winter helped Government scouts to run down elm bark beetles, insects that carry the Dutch elm disease now threatening the American elm with extinction. The woodpeckers, working on beetle-infested trees, removed the outer bark. The lighter-colored inner bark thus exposed was a signal to inspectors looking for infested trees.

Crews under the direction of entomologists and plant pathologists of the United States Department of Agriculture scouted for diseased and beetle-infested elm trees through Connecticut, New York, and New Jersey, where the Dutch elm disease is known to be present. A total of 2,138 diseased or badly beetle-infested trees were destroyed.

PAVO SCHOOL STEPS OUT ON FORESTRY PROGRAM

In 1933 the Pavo High School had a student, Herman Braddy, to win the Herty prize for doing the best work in forestry. This year the school is sending wood to the pulp and paper laboratory, Savannah, on which to print a forestry issue of the Pavo News.

The school has the distinction this year of having students to use scientific names of trees in standing the examination for camp scholarship. One student of this school, Clarence Edmondson, who was among the first to receive a forestry camp certificate of vocational forester, is employed as assistant technician in the timber survey now being carried on in the south by the federal government. The vocational agricultural teacher of this "forestry minded" high school is J. D. Davis, who is entitled to much credit.

INTERESTING FORESTRY FACTS

DID YOU KNOW THAT:

Intensively organized fire protection at an annual cost in 1932 of \$14,475,000 has been put into effect on a total of 321 million acres, of which about 290 million acres is commercial forest land.

There are 24 colleges in the U. S. giving instruction in forestry leading to a professional degree.

The putting of privately owned lands under fire protection has resulted in insuring productivity on about 25 million acres of private land, including the planting of 1.2 million acres.

A "beetle" is a heavy wooden mallet used in driving iron wedges or wooden gluts into timbers that are to be split open.

A "bug" is an improvised lantern made by fastening a candle in a tin can and fitting the latter with a wire bail or handle.

A "fool-killer" is a broken branch left hanging in the top of a tree when another tree is cut in logging.

R. D. FRANKLIN, Dist. Forester.

New Wood Preserving Method

Scientists in Germany discovered that paste of some inert substances with a high content of corrosive sublimate, or sodium fluoride, when applied to dry posts, poles, ties, etc., gradually penetrates the structure and reduces the wood's susceptibility to decay. It may take three or more months for the preservative material to make complete penetration.

"Erosion and floods have caused the abandonment of at least 8½ million acres of the Piedmont and Coastal Plains from the Potomac to the Mississippi, in the last 20 years."—F. A. Silcox, Chief of U. S. Forest Service.

FORESTRY QUESTION BOX

How does the Ginko rate as a shade tree?

Very high. The Ginko is among the oldest of tree species, but while it has broad leaves, it is in fact a conifer, or cone bearer. For some reason this beautiful tree, once prevalent on this continent, disappeared but persisted in a limited way in China. Because it was favored for planting in temple gardens, is probably the main reason why it has not become extinct in that country. Now it is a favored shade tree in this country. In Georgia, the city of Augusta has shown greatest appreciation of this rare species and has planted the Ginko along some of the streets.

It is necessary to clear some pine land this summer. What shall I do to keep worms from attacking adjoining pine woods?

It is always better to clear land in the late fall and winter, but if you have to cut trees in the summer, get the timber off the land as quickly as possible and immediately burn the limbs and refuse, preferably placing the piles to be burned on the tops of the green stumps.

The destructive southern pine beetle producing the worms that feed on the cambium under the outer bark of the pine, kills a tree by girdling it, that is by destroying the cambium through which the tree gets its vital fluids. The beetles are attracted by the odor of freshly cut wood and may concentrate in such numbers near by as to begin an infestation that may kill acres of pines.

Is anything being done to prevent the white pine blister from invading Georgia?

Yes. A survey is being made to see if the disease has appeared in Georgia. The Blister Rust Division of the U. S. Bureau of Plant Industry in cooperation with the Georgia Department of Entomology, are making investigations from Dahlgonega as headquarters for blister rust control in Georgia.

The investigation includes a search for the presence of this destructive disease on white pines, also for its appearance on secondary host plants such as gooseberries and currants, which are grown not only in gardens, but are found growing wild.

No report has been made that the disease exists in Georgia, but a complete survey has not yet been made. CCC men are used in the work in the north and west where the disease is proving very destructive, by eradicating the secondary host plants and destroying the infected pines.

PINE CANKER WIDE SPREAD IN SOUTHERN PINE BELT

From J. D. Diller, plant pathologist of the U. S. Department of Agriculture, who visited Georgia recently after making a survey from Virginia to Oklahoma, it is learned that the pine canker is prevalent through the south. A specimen of a canker found in Oklahoma showed that the disease had been there for more than 40 years.

Mr. Diller had previously inspected pine forests in Georgia and found the disease widely scattered, and had previously carried on some eradication work in Treutlen county.

How damaging the disease may prove to be, Mr. Diller says, remains to be developed from further study. It is readily apparent, however, that it is capable of doing a great deal of damage in that it attacks the cambium of the tree and when it girdles the tree it kills it, but should it not entirely girdle the tree then to the extent that it does the growth and naval stores production are decreased.

Pruning Roots of Seedlings

A statement made in this publication, that pine seedlings should be planted without pruning the roots, has brought information from an authoritative source that pine seedlings with roots pruned have grown off in tests better than unpruned. The claim also is that the tap root pruned back to 8 or 10 inches, if longer, saves excavation cost. Pruning is more generally needed with longleaf pine, which had a habit of centering growth on tap roots in its early life.

Example Planned Forest Management

As an example of the part that systematic and planned forest management can play in the stabilization and development of community life, F. A. Silcox, Chief Forester of the United States, recently cited in a meeting at Hot Springs, Arkansas, a forest property in that state where close to half a million acres are being handled to supply a continuous sustained yield of timber. Three sawmills and a number of affiliated plants are providing work for some 3,000 people year after year.

Cardboard Made From Southern Pine Pulp

Using pulp from the pulp and paper laboratory, Savannah, Ga., the Crichton plant of the Mobile Paper Mill Company made excellent cardboard, the first, it is claimed, ever to be made from southern pines. According to a message from Mobile, the mill officials said it was better cardboard than that made from imported pulp regularly used in the plant.

FIRST DISTRICT

Russell Franklin, Dist. Forester
Rome

GILMER COUNTY TO FRONT; APPROPRIATES TO FORESTRY

County Funds to be used in Forestry Fire Protection and Educational Program

Gilmer County has gone on record as being the first county in the State to appropriate money for education in forestry. The Grand Jury recommended that \$500 per year be paid to the Gilmer County TPO to be used as the TPO thinks necessary.

County Commissioner Hudson then authorized the County School Superintendent to pay this amount to the Secretary-Treasurer of the TPO. The TPO now plans to hire a man to carry on an extensive fire protection educational program in the county.

Gilmer County is composed of approximately 91 per cent forest lands, and with the aid of the CCC camp located at Ellijay is planning on having 100 per cent fire protection within the next few years. It is planned to locate at least two lookout towers in the county, and these, with the one already completed by the CCC camp, will be sufficient to cover the entire county. A system of telephone lines and patrol points has been worked out and partly completed. New roads and trails into inaccessible areas are planned, and, in some instances have been completed. The roads and trails that have been completed have opened up large area, and, according to Patrolman M. E. Pinson, have reduced the fire hazard to a minimum.

Much credit is due E. T. Hudson, M. E. Pinson, County Commissioner Hudson, and the citizens that were on the Grand Jury in making this work possible. They have worked diligently in the interest of forestry and are responsible for Gilmer County taking this pioneer step in forestry in the State.

SECOND DISTRICT

W. D. Young, Dist. Forester,
Gainesville

Farewell Party to CCC Men

Camp P-73 at Hiawassee held a farewell party on June 16 for enrollees going off the first of July after service of 12 months. These boys are reluctant to go and the supervisory personnel feel that they are losing many good men. New enrollees will arrive sometime in July to fill the places of the boys discharged, who have the wishes of the supervisory personnel of Camp P-73 and of the Georgia Forest Service.

Camp P-79, Cornelia, was abandoned on Wednesday, May 9. J. G. Ingram is ex-

taker. The enrollees and equipment went to Fort Pulaski, Savannah, Ga.

Camp P-69, Commerce, was abandoned on June 14 and S. G. Swindle is caretaker. The enrollees went to Alabama and the tools and equipment went to Pittsburg Landing, Tennessee.

Park Improvements Add Beauty

Now that summer weather has come, hundreds of people are thinking of trips to the mountains. The beauty of Vogel Park has been enhanced, and when the planned improvements are completed by the CCC Park Camp located there, it will be one of the finest state parks in the country. No one will make a mistake by visiting Vogel Park and enjoy the new scenic views opened up by new trails.

District Boundary Changes

District lines of the Augusta and Gainesville districts have been changed. Effective May 1, the district was extended to include the counties of Stephens, Franklin, Hart, Madison and Elbert, all taken from Augusta district. The Augusta District is extended to include Walton, Rockdale, Newton and Butts counties, all taken from the Gainesville district.

Appalachian Trail Conference

The annual meeting of the Appalachian Trail Conference, an organization sponsoring a hiking and horse trail along the crest of the Appalachian mountains from Mt. Oglethorpe, Ga. to Mr. Katahdin, Maine, will be held June 30, July 1 and 2 at Long Train Lodge near Rutland, Vermont.

Among those on the program is Warner H. Hall, Decatur, Georgia, president of the Georgia Appalachian Trail.

FOURTH DISTRICT

**W. G. Wallace, District Forester
Columbus**

E. C. W. Items

Fire lookout tower No. 17 constructed at Butler by P-78 for the Taylor-Talbot T. P. O. was struck by lightning June 2nd, caught fire, and was partially destroyed even though the fire occurred during a hard down pour of rain. Precautions are to be taken to prevent further losses from this cause.

Supt. Barrett at P-78, Butler, was very much disappointed over the loss of his hard working Mississippi boys who were recently transferred to their home state. However, he has a fine bunch of young men transferred from P-77, Tate, and he looks for no let down in quantity or quality of work.

P-56, at Warm Springs has been transferred to the Park Service and is now known as SP-7, but is still located at Warm Springs. Approximately 1500 acres of typically beautiful Pine mountain forest land has been acquired in Harris county to be developed into a State Park by SP-7 for recreational purposes.

Out-of-door recreation will be the key note in the planning and development of this park, the development of which has already been started.

The district forester takes pleasure in the appointment of Mr. J. S. Green of Butler as a new member of the Executive Committee of the Georgia Forestry Association. Past association with Mr. Green puts me in position to know that the association will be well served by Mr. Green.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Carpet Grass Firebreaks

C. B. Pfeiffer, Sec.-Treas., of the Briar Creek T. P. O. and owner of 10,000 acres of timber lands in Screven county, has planted carpet grass on his fire breaks.

Some 35 miles of primary firebreaks and truck trails were constructed on Briar Creek T. P. O. with CCC labor during the past winter. The question of maintaining the improvements put in with ECW funds came up to Mr. Pfeiffer, bought carpet grass seed and seeded in his truck trails and fire breaks.

To do well and stay green throughout the winter and fire season, carpet grass must be heavily grazed and Mr. Pfeiffer has about 200 head of cattle on the area at present. The grass is getting well established and will greatly reduce his maintenance cost during the fire season.

T. P. O. Buys Lookout Tower

At a recent called meeting, the Ogeechee T. P. O., covering lands in Chatham and Eastern Bryan counties, voted to assess themselves three cents per acre to buy and maintain a 100 foot steel lookout tower during the coming fiscal year.

Elliott Reed, of Savannah, a large landowner in the T. P. O., is secretary and John Carter, of Bloomingdale, is president.

Mr. Carter presided at the meeting and

when Mr. Reed called for a vote on the three cent assessment to buy the tower, every landowner present voted for it and authorized the secretary-treasurer to buy it.

The tower will be erected by the Camp located at Bloomingdale, and the T. P. O. will hire and direct the lookout and two patrolmen during the coming fire season.

Little River T. P. O.

A new Timber Protective Organization was recently organized, containing 16,000 acres, all of which is in a solid body and is situated in southern Wheeler county.

Jordan Brothers are the principal landowners and R. F. Jordan is the T. P. O. Sec.-Treas. Headquarters of the organization will be at Lumber City, Georgia, the home of the secretary-treasurer.

This T. P. O. will construct 100 miles of secondary fire breaks using a Hester fire break plow and a deisel tractor. A patrolman will also be hired to aid in fire detection and suppression. He will work five months, starting in December.

The name of "Little River T. P. O." was given the new organization at the meeting, as the land embraced in the T. P. O. is almost completely surrounded by the Little Ocmulgee river.

Tar City T. P. O.

At a recent meeting of the Tar City T. P. O., the land owners voted to buy the materials to construct a 100-foot wooden tower to supplement the 100-foot steel lookout tower, being bought for the T. P. O. from ECW funds.

M. V. Overstreet, president and pioneer timber grower, presided at the meeting.

This T. P. O. grew from F. F. F. organization in two years to a T. P. O. of 50,000 acres, due to the unusual amount of interest shown in fire protection work. There are some 400 acres of planted pines included in the lands of the T. P. O., Mr. Cox and Mr. Overstreet being the principal planters.



View of Highest Ranking CCC Camp, located at Homerville, Ga.

Resigns to Accept Old Position

W. H. Carithers, foreman at Camp P-63 McRae, has resigned to accept his old position with the Southern Bell Telephone and Telegraph Company. We regret to see Mr. Carithers leave, however, his position with the telephone company is a more permanent job.

Transferred

Mr. C. B. Ellington, formerly occupying the position of Camp Superintendent at P-57, Screven county, has been transferred to State Park Camp No. 5, located at Crawfordville, Georgia.

McLeroy Promoted

Mr. H. F. McLeroy, foreman at Camp P-82, Reidsville, has resigned his position to accept the position as Camp Superintendent at the newly established camp at Fort Pulaski, near the mouth of the Savannah river. Mr. McLeroy was very popular with all the men and very efficient in his work.

SEVENTH DISTRICT

C. Bernard Beale, Dist. Forester
Waycross

P-62—Baxley

The new contingent of boys who came to Baxley last month earned their six months salary the first day of arrival when a woodpile caught on fire behind the camp and would have burned the camp itself down had not 25 of the new men put fire-pumps on their backs for the first time and fought the scorching flames for an hour. They emerged with blistered faces and hands, but well broken-in to CCC life.

Work has begun on the two 100 foot wooden lookout towers furnished by the Appling County TPO. Foreman M. J. Maynard, formerly from P-79, Cornelia, is in charge of construction. The towers are of the patented split-ring type, designed by the Timber Engineering Company of Washington, D. C. The use of split-rings in wooden construction greatly increases the strength of joints, and therefore, allows the use of much smaller wooden members in construction. Plans for the construction of six such towers are underway in this district.

General Notes

Fire break construction and maintenance reached a higher degree of perfection when road graders were shipped to camps in this district. While it takes a few more trips with a grader than with the wheatland plows, to construct a break, the break can be traveled by trucks, is easier to maintain, and has a ditch on each side, making it more effective as a fire barrier. The low cost of repairs on the grader as against the upkeep cost on plows, will make fire break construction with graders more economical than with plows, it is believed, despite the extra trips required to construct a break.

EIGHTH DISTRICT

H. D. Storey, Dist. Forester
Albany, Ga.

Forestry Exhibit at Flower Show

One of the exhibits at the largely attended and successful flower show at Albany, May 2, was a display made by the district forester representing two farms, one typifying prosperity with green forest well protected, green fields, home with shade trees. The other showed burned forests, dead trees, eroding slopes, and an air of desolation and poverty.

The exhibit attracted much attention. The district forester watched the reaction on visitors, and found some returning to it the second time to study the picture of contrasts. School teachers especially pointed out to their pupils the lesson to be learned of the result of forest fires.

Patrolman Employed

The Flint River Timber Protective Organization recently voted an assessment for paying a full time patrolman. The patrolman is now at work on the organized area. The interest shown by the members of this organization promises to develop into a very active and efficient organization.

APRIL FIRE LOSSES

The forest fire reports for April sent in by superintendent of CCC camps operating under the state, show that for the month there were 349 fires burning over 88,179 acres, doing damage of \$153,339.51. Of this amount \$49,784 is the result of the destruction of crude gum and turpentine cups in the forest.

Twelve of the fires were attributed to campers, 4 to smokers, 38 to brush burners, 147 were purposely started, 7 to lumbering operators, 5 to naval stores operators, 25 range burning and 111 miscellaneous.

How Forests Hold Rainfall

Tests at the Lake Forest Experiment Station, St. Paul, Minnesota, show that after 3.37 inches rainfall, not more than a trickle of water came from the forested area, with no sign of soil washing. From a field area adjoining, the run-off was 29 per cent of the precipitation and the soil carried off was 5.4 tons per acre.

"The lumber industry in the South uses 24 per cent of the people: pays 10 per cent of industry payrolls and its products represent 10 per cent of the value of manufactured products."—Ed R. Lynn, Forester of the Hardwood Manufacturer's Institute.

C. J. Davison, president of the Woodville T. P. O., recently died. His leadership will be missed, not only in the organization, but in the community and county.

Planting Program for South

The U. S. Forest Service in its recently published report—"A National Plan for American Forestry"—sets up the following planting program for the South:

	Acres
Denuded or poorly stocked area	43,555,000
Submarginal agricultural land	19,000,000
Total non-productive area available for forestry	62,555,000
Area that will restock naturally	45,000,000
Area requiring planting	17,555,000
Area to be planted during next 20 years	5,750,000

Of this area of 53-4 million acres, the Service estimates that 1½-million acres should be planted purely to increase timber production on high quality land. The remaining 4½-million acres of planting is required chiefly for erosion control. To date, only about 62,000 acres in the South have been planted, so the program must obviously be greatly expanded.

Fire Losses In South

According to the Southern Forest Experiment Station, New Orleans, the 5-year period, 1928-32, inclusive, shows an average of more than 43 million acres of forest land in the 11 Southern States burned over annually. On the area under organized fire protection an average of 3.5 percent of forest land burned over annually, whereas an average of 26 percent of the unprotected forest area burned over each year during this 5-year period. Sound knowledge of all phases of the forest fire problems is essential to the formulation of an adequate program of forest land use in this region.

Pine Pole and Piling

Association Formed

The Southern Pine Pole and Piling Association, consisting of producers, manufacturers and distributors, representing 17 states, was formed in New Orleans May 21. The officers are: President, A. N. Lewis St. Louis, Mo.; Vice president, S. C. Braselman, New Orleans, La.; Secretary-treasurer, E. H. Chapman, Memphis, Tenn.; directors, R. H. White, Jr., Atlanta, Ga.; J. F. McDaniel, Norfolk, Va.; C. Gewalt, Mobile, Ala.; and H. L. Trest, Louisville, Miss.

One of the objects of the organization it is stated, is to secure a separate pole and piling NRA code.

Cultivated Black Locusts

The Southern Forest Experiment Station, New Orleans, shows, as the result of experiments with the cultivation of black locusts, that cultivated trees the first growing season after planting had twice as many leaflets, four times the leaf area, 1 per cent higher growth and more branches than the uncultivated.

The cultivation in one instance consisted of two furrows plowed on each side of the row of trees, and in another instance, hoeing 18 inches around each tree.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

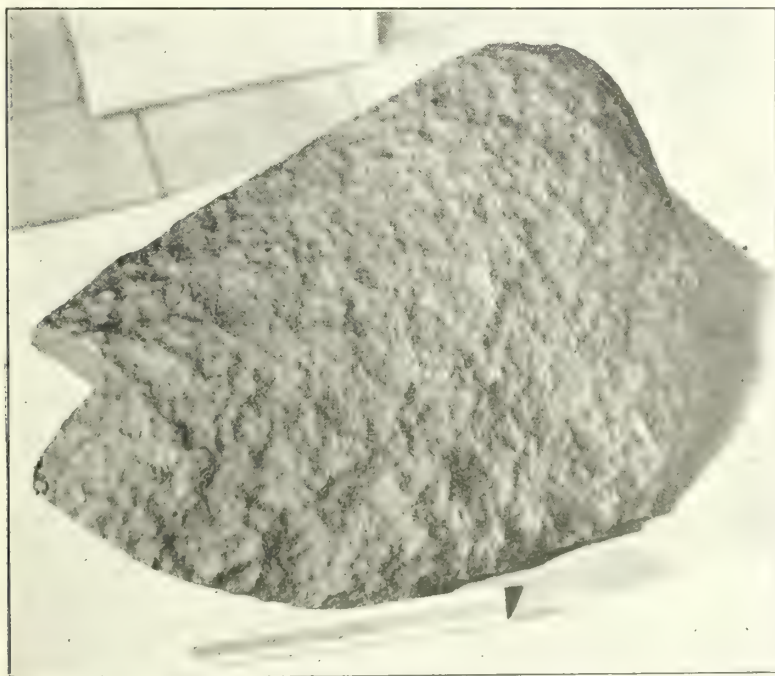
METEORITES FOUND IN GEORGIA

Geoffrey W. Crickmay

Meteorites are of little value as sources of minerals but to the scientists they are of singular interest, for, aside from the more illusive light rays, they are the only tangible evidence we have of the composition of the starry bodies. They come to the earth indeed as messengers from space. They are actual samples of matter from beyond the earth that can be weighed, examined under a microscope, and analyzed chemically. Each meteorite is named, usually for the locality where it is found, and a record is kept of all its characteristics. In the last 125 years hundreds of such records have been gathered all over the world from which scientists can tell us something of the message that a meteor brings from space. Some general conclusions regarding the meteorites are here re-

usual characteristics mentioned below, they attract attention. Of the 11 "finds" in Georgia all are "irons" but of the 4 "falls" three are "stones".

The size of meteorites varies from dust-sized particles to masses of many tons. The largest is the "Cape York" the weight of which is 36½ tons. The immense "iron" was found in Greenland and is now on exhibit at the American Museum of Natural History in New York. The largest fall in Georgia is the Social Circle "iron" with a weight of 219 pounds which is now on exhibit in the mineral collections at the State Capitol; the smallest is the Stewart county "stone" whose weight is only 12½ ounces. Many of the smaller meteorites, such as the three from Whitfield county, may be fragments of larger masses that have broken up shortly before they struck the surface of the earth. Such is the case with the Pitts "iron" of which four pieces were



Iron meteorite weighing 219 pounds, found near Social Circle, Madison County, Georgia. On display in the State Museum, 4th floor of the Capitol, Atlanta.

viewed in the light of the 15 meteorites that are known to have fallen in Georgia.

In the early days of their study, meteorites were classified as "falls" and "finds" depending on whether they were seen to fall or were found after their fall. A more satisfactory classification, now generally used, divides them, on the basis of their composition, into "stones" and "irons". There are more "stones" than "irons" seen to fall but the "finds" are mainly "irons" because due to their weight and other un-

usual characteristics mentioned below, they attract attention. Of the 11 "finds" in Georgia all are "irons" but of the 4 "falls" three are "stones".

In their structure and composition meteorites are so characteristic that identification of specimens not seen to fall can be made with some certainty. The "irons" always contain nickel to the extent of 4-5 per

cent or even more, and generally some cobalt, but most peculiar and characteristic is their crystalline structure, well displayed on etched surfaces, which is unknown in any terrestrial iron. The specific gravity of the "irons" is generally over 7.00 and in the case of the Paulding county "iron" is nearly 8.00. In most cases meteorites can be recognized by their pitted and fused surfaces, commonly of a darker color than the center. This characteristic surface is well shown in the case of the Pitts "iron" which fell on the morning of April 20, 1921, near the town of Pitts, Wilcox county. This meteorite attracted considerable attention at the time for its path through the sky was visible from Henry county near Atlanta, to as far south as Moultrie in Colquitt county. The "stones" are more difficult to recognize and generally certain identification can be made only by microscope examination and by chemical tests.

The phenomena accompanying a meteorite's fall, mainly light and noise, are due almost entirely to the resistance of the air which by friction slows down the speed of the fall and develops heat estimated to reach 7000° F. The heat is sufficient to melt the surface and the molten material is continually blown off by air currents leaving a train of smoke behind the falling body. In most cases the fall is accompanied by a whizzing noise interrupted by explosive outbursts that are described as similar to thunder or cannon fire. These noises appear to be due to the explosive expansion of the air on sudden heating but it may be due in part to the sudden breaking up of the meteorite itself, brought about by the disruptive force of the air. The effect is the same as if an automobile were driven at 30 miles an hour into a stone wall, although in the case of a meteorite the speed is possibly nearly as many miles in a second. By the time the meteorite strikes the ground it has been slowed up to about 500 feet a second (about 370 miles an hour) and it is "cool enough to be handled". If the meteorite strikes a soil covered spot its speed is, however, great enough to bury the mass in the ground to a depth of 1 to 3 feet.

It is important that any new falls or finds be properly and thoroughly described and to this end the public can render a service by sending information to the Division of Geology at the State Capitol in Atlanta. If a meteorite is seen to fall a careful record of its appearance and position should be kept. To the novice meteorites may easily be mistaken for some of the ordinary rocks, particularly those rich in iron, and some caution is necessary in selecting specimens. Meteorites have been found in the following counties: Chatham, Cherokee, Dorset, McDuffie, Monroe, Paulding, Pickens, Putnam, Stewart, Union, Walton, Whitfield, and Wilcox.

The study of meteorites, meteorology, was in its infancy at the beginning of the last century. At this time there was considerable debate as to whether stones actually

fell from the heavens and in some circles it was considered almost sacriligious even to consider such a possibility. But the affirmative side soon won the argument for, as though to favor their cause, a number of meteorites fell during the period of the argument from 1800 to 1830, which were seen by many witnesses. Not the least important in this group was a 36-pound "stone" which fell in the afternoon of May 8, 1829, in central Monroe county. A full description of the fall appeared in a scientific journal in 1830 and after that date no one seriously questioned the extra-terrestrial origin of meteorites. But the question of where they come from was still unanswered; were they fragments of stars, chips off the moon, or perhaps pieces of a comet? It is now generally agreed amongst authorities that meteorites are derived from comets that pass so close to the earth that part of their bulk is pulled away by gravity and falls through our atmosphere as a meteor or falling star. If it is not destroyed by the terrific frictional heat of passing through the air, it falls to the earth as a meteorite.

A discussion of meteorites is not complete without some mention of two more hypothetical cases of larger meteorites that have fallen in the past. The best known is that of Meteor Crater in Arizona, which consists of a more or less circular depression 4200 feet from rim to rim and almost 600 feet deep. It is now generally agreed that this great hole was formed by the impact of a large meteorite which struck the earth with such force that it buried itself deep below the surface.

Another and more theoretical case is that of the Carolina "bays" which have gone unnoticed until recent aerial mapping disclosed their presence on the coastal plain of South Carolina. They consist of shallow hollows of oval outline, all oriented with their longer dimensions in a northwest direction. A theory has been proposed which explains these unusual forms as the pits formed by impact of a swarm of meteorites. The orientation of the scars, it is claimed, is due to the oblique direction of the swarm's path. However, other authors have claimed, with some reason, that the so-called meteor scars are a type of beach deposit and that their orientation is merely due to prevailing winds and water currents. No entirely satisfactory explanation has been offered but if the meteor theory is correct a careful search should disclose fragments of meteorites possibly buried at some depth.

References: "Meteorites"—O. C. Farrington, Chicago, 1915; "The Pitts Meteorite"—S. W. McCallie, Georgia Geol. Survey, Bull. 39, 1922; "Our Stone Pelted Planet"—H. H. Nininger, Cambridge, 1933.

GEORGIA SOCIETY FOR ARCHAEOLOGY MEETS ATLANTA, CARTERSVILLE

The Georgia Society for Archaeology held a dinner meeting on Friday, May 18th, at the Capitol City Club in Atlanta, the principal speakers being Dr. C. C. Harrold, of Macon, President of the Society, and Clark Howell, Sr., Mrs. Wayne Patterson, and Ivan Allen, of Atlanta. The program was under the direction of Dr. A. V. Henry, of Georgia School of Technology. On Saturday, May 19th, the society made a field trip to the Etowah Indian mounds near Cartersville and Fort Mountain near Chatsworth, with a luncheon at the Braban Hotel at Cartersville arranged by the Cartersville people.

Mrs. M. E. Judd and J. M. Mallory, members of the Commission of Forestry and Geological Development, and State Geologist Richard W. Smith are members of the executive council of the Society and attended the meetings. The Georgia Society for Archaeology was organized last year to study and to preserve in Georgia for Georgians the relics of the prehistoric American Indian, and to prevent the promiscuous digging into Indian mounds and unscientific collection of the relics.

PRESERVATIVE METHODS FOR STORED TURPENTINE

Under ordinary methods of stored turpentine, rapid deterioration takes place. W. C. Smith and H. P. Holman of the United States Bureau of Chemistry and Soils reported at the meeting of the American Chemical Society, held at St. Petersburg, Florida, methods that they had devised resulting in long period preservation. They recommended storage in air-tight metal tanks with interior shellaced, so arranged that water settling out of the turpentine can be drawn off frequently at the base. Kept in this way, the turpentine did not deteriorate when stored from 26 to 31 months.

At the end of this storage, turpentine was stored in shellaced metal drums. At the end of four years most of the turpentine was still in good, marketable condition.

The chemists also claimed it was possible to preserve turpentine by adding certain chemicals, such as powdered lime, bisulphite of soda, hydroquinone and pyrogallol, but these foreign substances have to be filtered out when the turpentine is used.

The economic result of preservative methods, it is claimed, will be that producers can store turpentine when prices are abnormally low and sell as prices rise.

REGION OF HEAVIEST RAINFALL

The region of heaviest rainfall in the southern Appalachians is along the Blue Ridge in the vicinity of Highlands, N. C., where the normal annual rainfall exceeds

60 inches. This heavy precipitation is typical of northeast Georgia and southwestern North Carolina.

The United States Weather Bureau reports that it is not the result of a large number of rainfalls as much as to the amount of precipitation of each rainfall.

EXAMINATION QUESTIONS CAMP SCHOLARSHIP TEST

Examinations of Students Held April 28 to Determine Winners of Scholarships for Vocational Forestry Camp

The list of questions given below was issued in the annual contest for vocational forestry camp scholarships in each county having rural consolidated high schools with vocational agricultural teachers. The examination was held April 28.

A scholarship entitles the holder, without expense, to attend six weeks of the vocational forestry school camp, a term of three weeks being conducted each summer. Those who complete the camp work satisfactorily receive a certificate of vocational forester.

Examination Questions for Awarding Camp Scholarships

1. What are the main reasons why fire should be kept out of the forests?
2. Name the kind of oaks found in your community.
3. Name four leading species of pines in the state; (a) Which kinds are found in your community?
4. At what time of the year should you gather pine seed? (a) How do you care for pine seed until time for planting?
5. Describe methods of making a seed bed; (a) Tell how to plant seed in seed bed; (b) Tell how to take care of the seed bed and seedlings until time to plant.
6. Describe methods of planting pine seedlings in the field.
7. Which of the following trees are most durable in contact with the soil, and are therefore best suited for fence posts? White oak, chestnut, young pines, cedar, Spanish oak, black locust, yellow poplar, cypress, black gum, sassafras.
8. What does the white wood in an annual growth ring represent, and what does the dark ring represent?
9. What are the main forestry subjects you have studied in school?
10. What pines of Georgia are chipped for turpentine?
11. What are the main reasons for making thinnings and improvement cuttings in a forest?
12. Give reasons for planting trees on abandoned and eroded fields.
13. What kinds of wood are best suited to making axe handles, hoe handles, wagon wheels and the like?
14. What methods are used for making firebreaks?
15. Describe your home project in forestry and what you have done on it.

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FORT MOUNTAIN PARK GIFT OF IVAN ALLEN

Crest of Picturesque Mountain With Stone Fort of Unknown Origin Included in State Park Area— CCC Men Engaged in Develop- ment.

Fort Mountain in the Cohutta range of North Georgia is the site of one of the new state parks now being developed with CCC labor. It is through the generosity of Ivan Allen, a business man of Atlanta, that the state came into possession of this beautiful and interesting property. It is beautiful for scenic value in itself, and beautiful for sweeping views that its crest provides. It will be interesting because of the stone fort constructed by someone and for some purpose of which history bears no record.

Fort Mountain Park is near the scenic mountain highway connecting Chatsworth and Ellijay, being 12 miles from Chatsworth and about 20 miles from Ellijay. It is reached from the highway by a road 2½ miles in length now being constructed.

The area donated by Mr. Ivan Allen embraces 119½ acres on the crest of Fort Mountain in which is located the prehistoric stone fortification about 885 feet in length made of loose stone and designed with military skill. While the wall of the fort is not more than two feet high, it has a base of about 12 feet. At fairly regular intervals in the walls are 20 pits, the purpose of which is not clear. The wall zig-zags and bends irregularly and reaches from one precipice on very steep terrain, to another. At one point is a gateway where the masonry was heavier, but is closed by fallen stones. This gate led to a spring 1277 feet south. The remains of what were apparently two lookout towers are to be found.

This strange and unaccounted for fort has started historians and archaeologists into various speculations. A theory was advanced that DeSoto may have erected the fortress during his famous exploration in 1540, but historians who have checked up on the itinerary of DeSoto find that it is not likely that he had time or occasion for erecting a fort in Murray county. The Indians were friendly and brought baskets of mulberries and nuts to DeSoto in a spirit of hospitality.

Dr. Warren K. Moorehead, eminent archaeologist, who has made a study of the fortifications and surroundings, gives as his opinion that a large force of Indians, hard pressed by enemies, hastily built a stone fort for defense, but he thinks that the expected assault never took place since no arrowheads are found to witness a battle.

Another theory, and one held by Mr. Allen to be the most plausible, is that it was built by Spaniards who, while still holding Georgia, sent out mining parties with authority of the Governor at St. Augustine, Florida, to follow up clues that DeSoto's party brought back. One of the leaders was Juan Paedo, who came direct from Fort San Filipe, South Carolina. He, it is thought, erected a fort as a defense against the Cherokee Indians in whose domain the Spaniards were seeking gold and silver.

At any rate, the old fort remains an intriguing mystery. This state park, therefore, does not commemorate any historic event in a strict sense, but an event, if not prehistoric, then of lost history.

The state parks of Georgia are in charge of the Department of Forestry and Geological Development. Plans for the development of the parks originate with Mrs. M. E. Judd, Dalton, Park Authority for Georgia, and member of the Commission of For-

(Continued on Page 2, Col. 1)



Hon. Ivan Allen, Donor of Park Site on
Fort Mountain

SUWANEE FOREST W. N. E. E. RADIO FIRE PROTECTION

Ranger Cars, Trucks, and Fire Crews Have Radio Equipment for Instantaneous Transmission of Messages — Quick Action in Fire Control on Vast Acreage of Superior Pine Products Company Thus Obtained.

By W. M. OETTMEIER, *Forest Manager*

In the past few months several publications have carried articles concerning the use of radio by Superior Pine Products Company on Suwannee Forest in its fire protection scheme. These articles were more or less in anticipation of what was hoped could be achieved. However, in the past few days the scheme has been very nearly completed and is going to work out as well or better than originally hoped.

After considerable delay and through much correspondence, the Federal Radio Commission was persuaded to grant Superior Pine Products Company a license for this work. A Special Temporary license authorizing operation on 2726 kilocycles was issued with the call letters W-N-E-E. On the original license the power was limited to 50 watts, but several times the power insufficient to cover Suwannee Forest, the longest airline distance being approximately 32 miles. Consequently a 100 watt license was issued on the 100 watt transmitter which on a number of occasions here has proven adequate to handle the situation. The transmitter is a Collins 100 watt and has given a satisfactory account of itself.

Rangers cars, fire crews and several fire trucks are equipped with radios and are able to communicate with each other. The radios are all tuned to the same frequency and the messages are transmitted directly to the receiver. The transmitter is located at Fargo transmission a short distance from the forest. The radios are being used to great advantage in the control of every fire.

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FORT MOUNTAIN PARK GIFT OF IVAN ALLEN

(Continued from Page 1)

estry and Geological Development. Approved by State Forester B. M. Lufburrow and representatives of the national park department at Washington, the plans for developing the parks are carried out by CCC workers.

The plans call for a two-way road from the highway to the top of Fort Mountain. The road will be surfaced with gravel or crushed stone. Culverts are to be made of cement rubble. This road is to be landscaped with plantings along its borders of azaleas, rhododendron, kalmias, redbud, red maple and other native vegetation. A 45-foot stone observation tower, to be erected on top of the mountain, will be made of weathered stone.

The plans call for a two-story park inn of weathered stone construction 24 by 70 feet in dimension, with a Devonshire moss mottle green tile roof, hewn oak lintels and beams, and with brown creosote treatment of exterior wood. This structure will be erected just below the old fort and will face the valley to the west.

Eventually, it is hoped that through gifts the park area may be enlarged to join up with the Cherokee National Forest on the mountain side and extend into the valley below, where a lake and camp buildings may be constructed for public use.

The donor of this park site, Mr. Ivan



VIEWS OF FORT MOUNTAIN PARK

Top, View of Park Site. Middle, View of old Stone Fort. Bottom, Road under construction on mountain.

Allen, is a native of Dalton, Georgia, situated in a county adjoining that in which Fort Mountain is located. In his youth Mr. Allen developed a desire to own Fort Mountain. It was in 1926 that he found his dream realized, with the crest of the mountain and the strange fort his very own. His first thought was to bring the world to his beautiful mountain by constructing a hotel and making a beautiful resort. But that dream did not materialize, though his desire to draw people to the mountain top persisted. Happily, this desire is to mater-

ialize, but only through sacrifice. He has given his mountain to the state that it may become a public park, and after all become the glorified mountain of his dreams.

Three members of the Hardwood Manufacturer's Institute in the South, Lee Robinson, Mt. Vernon, Ala., John Raine, Rainelle, West Va., and C. C. Sheppard, Clarke, La., with seven others from other sections, sail on July 26 for Germany and Austria to study European forest conservation methods.

SUWANEE FOREST W. N. E. E. RADIO FIRE PROTECTION

(Continued from Page 1)

Three lookout towers with lookouts on watch continuously during daylight hours report all smokes immediately to headquarters at Fargo, where the smoke is checked on a map by triangulation. If the fire checks on Suwannee Forest or close enough to the boundary line to be dangerous the nearest fire crew and ranger is called, told of the location and told to proceed to it at once. At various points in the forest there are landline telephones and on coming by or near one of the phones the crew reports in to headquarters to indicate that it is on its way to the fire, and to receive further instructions. After the crew arrives at the fire it keeps a constant watch on the radio, since the lookout towers can detect almost immediately any fresh breakout of the fire where it had already been put out, or in other words, a breakout behind the fire fighters. This information can be immediately passed on to the crew fighting the fire, which in many cases will be the means of preventing lost time and lost effort.

Radio will be a means of catching up with and apprehending persons maliciously stringing fire through the woods. The lookout towers can tell almost the exact course of the incendiary by watching the various points from which smoke arises. By passing this information on to a ranger, the ranger in many cases will be in position to apprehend the person doing the firing.

At the present time only one way communication is possible but it is hoped that in the near future a system may be worked out whereby it will be possible for the fire crew to acknowledge receipt of a message if only through a signal and not by voice.

Considering that up to date and during the poorest radio conditions communication was maintained between headquarters and a moving car thirty miles away it is firmly believed that radio will be a great asset and the means of saving many acres from destruction by fire.

Strength of Longleaf Pine Wood After 112 Years' Use

Interesting evidence of the durability of wood is found in a test conducted by students of the College of Civil Engineering at the University of Maryland.

Three compression specimens of longleaf pine taken from timbers removed from the White House roof in 1927, after they had been under stress for 112 years, were subjected to the test. The specimens, which contained 11, 13, and 14 annular rings to the inch each, showed an average unit stress of 5,111 pounds to the square inch.

NOTES FROM VOCATIONAL FORESTRY CAMP, TIFTON

As this issue of the Forestry-Geological Review goes to press, the fourth annual vocational forestry camp is in progress at the Abraham Baldwin College at Tifton. One of the best, if not the best is being held. The 95 boys from the rural consolidated schools with vocational agricultural courses are a fine bunch of young men who have won camp scholarships by high grades in forestry, by high general scholarship, and are recommended as having high moral standards.

Their course of study in classroom and field is being carried on with enthusiasm and earnestness. Gratifying school work is in progress. But it is not all work. Recreation is being emphasized, to make the camp pleasant. The food prepared under the direction of Miss Creswell is excellent. The splendid athletic fields and equipment are available.

A new feature of the camp is daily instruction in swimming and life saving. Through the generosity of the City of Tifton, a swimming pool is obtained free of charge. Through the liberality of the Red Cross Society of America, two experts are made available for instruction in swimming and life saving. As a result of six weeks training, it is expected that a number of the boys will qualify for certificates of life savers.

The two men assigned to the camp by the Red Cross are J. H. Kinney, Moultrie, Ga., and S. P. Lane, Brevard, N. C.

The staff of camp teachers consists of the following: C. A. Whittle, Atlanta, director; M. D. Mobley, Atlanta, camp manager.

C. N. Elliott, Augusta, teacher of tree identification; H. D. Story, Jr., Albany, teacher of forest management; W. D. Young, Gainesville, teacher of surveying and timber cruising; Russell D. Franklin, Rome, forest management; George Moseley, Waycross, teacher of forest management; Gordon Wallace, Columbus, teacher of surveying and timber cruising; K. S. Trowbridge, Tifton, teacher of naval stores practices. Mrs. M. D. Mobley, Atlanta, is camp secretary.

Vocational agricultural teachers assisting are T. G. Walters, Moultrie; Claud Bray, Hogansville; H. L. Simpson, Plains; J. N. Young, Armuchee.

One of the objects in holding the camp this year in South Georgia is to give the boys some idea of how naval stores are produced. Chipping, dipping and all the steps in producing resin and turpentine were studied in the woods and at a distilling plant recently constructed according to modern methods. K. S. Trowbridge conducted the field studies. Lenthall Wyman, Lake City, Florida, in charge of naval stores

work of the U. S. Forest Service, spoke to the boys, giving them much valuable information out of his wide knowledge and experience.

ATLANTA MADE SOUTHERN FORESTRY HEADQUARTERS

Beginning with July 1, Atlanta became headquarters of the Southern National Forest Region and of state relations in the administration of the Clarke-McNary Law.

The new regional office handles the administration of national forests and states' relations in North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi, Louisiana, Texas, Arkansas, and part of Oklahoma. The office is in charge of Joseph C. Kircher. Other officials are: H. O. Stabler, Chief of Operations; A. C. Shaw, Chief of Forest Management; Wm. P. Kramer, Chief of Division of Lands; and C. F. Evans, Chief of States Relations. Assistants to Mr. Stabler are: James F. Brooks and G. C. Bell. Mr. Kramer's assistant is P. J. Paxton. Bennett C. Hughes is an assistant to Mr. Shaw. H. J. Ellerby will be under Mr. Evans, and as inspector of the Gulf States, Mr. Ellerby will have headquarters at New Orleans.

H. B. Herms has charge of finances and accounts at the Atlanta office and R. E. Pidgeon is regional engineer; George Root, Darnall Burks and Wm. N. Sloan are associate engineers.

The offices are in the Glenn building, corner Marietta and Spring streets, Atlanta.

SUGGESTS LESPEDEZA AND CARPET GRASS FIREBREAKS

Commenting on an article in the "Review" concerning carpet grass on firebreaks, Gordon E. Reynolds, Reynolds Bros. Lumber Co., Albany, Ga., says:

"I want to supplement your suggestion with the statement that a combination of Lespedeza and carpet grass will be best because the carpet grass will not do well on high land and the Lespedeza will not thrive in low, wet land. Red or clay soil is best for the lespedeza. High, dry, sandy land will not produce either lespedeza or carpet grass, but at such poor places the wild vegetation will be small and will offer only the minimum of fire hazard.

"The coming of cattle industry into this section will prove valuable to forestry because the two go together so well. People are fast learning that the best pasture lands are those that are not burned and when this schooling is complete the burning of woods will be reduced to the very minimum.

"The greater portion of the firebreaks throughout our company's holdings will be permanently maintained by grazing of cattle on same."

FORESTRY QUESTION BOX

CONSERVING FOREST SOIL FERTILITY

By C. A. WHITTLE

Are there legumes in forests that add nitrogen to the soil?

When the land is well stocked and the crowns of trees make a complete canopy, legume plants are not present. But if the trees are small or scattered, the open spots do afford an opportunity for wild legumes to grow. Among these, the most common in the south are lespedeza, beggarweed and black medic. Unfortunately, sedge grass, wire grass, palmettos and gall berries dominate the ground cover and suppress the less hardy legumes over a considerable portion of the southern pine belt.

Does not the calcium, phosphorus and potash, left as ash by forest fires promote legume growth?

On open spots in the forest, the readily soluble minerals, especially the calcium in the ash which is the most abundant of mineral salts, should promote the growth of legumes. Although fires destroy the nitrogen in the organic matter by sending it off in the air as gas, it may be possible for legumes on open forest areas to restore or even increase the soil nitrogen, but as a matter of course, the loss could not be restored by legumes on well stocked crown-covered land, where they do not and cannot grow.

Is it not claimed that the ash left by fires increase nitrification in the soil?

Yes. Nitrification may be increased, but remember that nitrifying bacteria are constantly reducing the store of nitrogen in the soil, and never increase it as do the nitrogen fixing bacteria that operate on legume roots. Nitrifying bacteria convert the nitrogen in the organic matter in the soil into nitrates or that form of nitrogen that is available for plants to use. If the organic matter of the forest floor is burned off, then the nitrifying bacteria has less organic matter on which to work. Until the organic compound of nitrogen in the soil are reduced to a low ratio, fires may increase the supply of available nitrogen, but in doing this at heavy expense to the soil. It is like burning the candle at both ends. Eventually the available organic nitrogen in the soil will be so depleted that it will seriously reduce the growth rate of the forest. It cannot be otherwise.

But is there not a class of nitrogen fixing bacteria that do not operate in nodules of legumes whose activity can be stimulated by the fire ash?

The azotobacter bacteria do fix nitrogen independent of legumes, but these, too, are dependent for their energy of the carbon or organic matter that forest fires destroy. Moreover, the azotobacter bacteria have never been found active in acid soils such as universally prevail under forest conditions and which is not corrected by the ash left by fires. It is not at all likely, according to findings of bacteriologists, that non-legume nitrogen fixing bacteria can function under forest conditions.

Are not the minerals of wood ash more readily available as plant food than the same elements in organic compounds?

Yes. They are readily soluble, but the fact that they are readily soluble also results in unnecessary loss of these elements by surface wash, or, in the case of sandy soils, through leaching. Soluble nitrogen is even more subject to leaching than the mineral plant food elements.

A fact established by soil scientists long ago is that conservation of fertility is dependent in large measure, on most soils, by the presence of organic matter. Therefore, conservation of the fertility of the forest soil depends on keeping out fires.

Southern forest soils are low in fertility. The best soils have been taken for agricultural crops. Waste of soil fertility through fires is most unfortunate.

Does the presence of organic matter increase the store of moisture in the soil?

Numerous soil studies in this and foreign countries show that soils containing organic matter hold more water than soils containing little or no organic matter. Southern soils do not contain much organic matter, as a rule, because the processes of decay or oxidation are very active all the year. But the little that does exist is very important both in increasing the soil's store of water for meeting the heavy moisture requirements of growing trees, and by checking leaching loss of soluble plant food in the soil.

No forest soil of the south can be burned over without suffering loss of plant food directly or indirectly, manifested sooner or later, and the soil will be reduced in moisture holding capacity, a very important factor affecting tree growth. (To be continued.)

"The Ex-Kaiser's grandson, before marrying a commoner, was forced to give up his rights to the German throne. This must be almost the ultimate zero in concessions." Southern Lumberman.

Cypress sills embedded in the ground by Seminoles 150 years ago to form a foundation for a brick fortress on marshy land of Louisiana, not only served their purpose well, but recent excavations revealed the cypress logs still sound.

FIRST DISTRICT Russell Franklin, Dist. Forester Rome

T. P. O. Notes

The Conasauga T. P. O. is in process of being enlarged.

Signs showing location of towers, trails and large T. P. O. signs are being painted and are to be erected on the Gilmer, Pickens and Cloudland areas. These signs will be of much value from an educational standpoint.

E. C. W.

A trainload of new men arrived at SP and every one was rather amused at their inability to handle tools. But the boys are rapidly getting in shape now, and will soon be men of the type turned out by the CCC.

Interesting Forestry Facts

Did you know that?

"Dutchman" is a plank nailed to a tree to prevent barbed wire or other wire from cutting into the tree.

A "Housewife" is a cloth or leather receptacle for sundries used in repairing clothes (term used by woodsmen in the Rockies).

The South contains 40 per cent of the forest area of the United States, but only 25 per cent of the total volume, and only 1 per cent of the saw timber.

That in 1930 54 per cent of the total requirements of wood pulp for the United States was supplied with foreign wood.

THIRD DISTRICT C. N. Elliott, District Forester Augusta

Side Camp Approved for Milledgeville

Officials of the park service have approved a side camp for SP-5, Park camp at Crawfordville, to be set up on the state hospital grounds at Milledgeville. This camp will be composed of approximately 35 CCC boys and one foreman and will confine its activities to forestry work on the state hospital grounds. Such projects as thinning, fire break construction, and planting will be carried on in the system of management. Approximately six months work had been allotted to the state hospital on the main camp at Crawfordville.

Forestry Students at Watson Springs

University forestry school students are this year making their summer camp at Watson Springs in Greene county. Recently Colonel Watson gave this land to the University of Georgia and the college turned it over to the forest school. The summer camp, heretofore held each year in the

mountains of the state, was transferred to this new holding of the University. The students are making a management plan of the tract, and expect to carry on some real forestry work there.

Indian Springs Attracting Much Attention

The trails which have been laid out in the park of Indian Springs have attracted much attention during the hot summer days. Persons coming to the spring usually spend an hour or so walking in the park trails. Benches have been placed all along the trails, and now and then a spring may be found. The huge trees, flowers and shrubs of this park area make it a delightful place on the hot summer days.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Ocmulgee T. P. O.

On July 11th, a meeting of the Ocmulgee T. P. O. was held, the chief business of the meeting being to decide where the location of the tower the T. P. O. is to buy will be.

There are approximately fifty thousand (50,000) acres of T. P. O. lands that will be served by this one tower. The members are vitally interested in getting this tower up before the next fire season and they have hopes of getting one other tower from ECW funds to supplement the one that the T. P. O. will buy.

A three cents per acre assessment was voted to cover the purchase of one 100-foot tower, which will be built by CCC labor. Enough surplus telephone wire is left over from some of the other camps in this district to put in a telephone system covering this one tower set-up.

Swainsboro Side Camp

Construction on the Swainsboro side camp is going forward rapidly and will probably be completed by the 25th of July.

The base for this side camp will be P-61, Soperton, Georgia, which has been in operation for the past fourteen months. The side camp will have sixty men, under the direction of three foresters. Firebreak construction will be started on land listed in the Emanuel County T. P. O. just as soon as the camp is finished, provided the camp strength is brought up within the next few days.

The camp in Swainsboro is located at the old fair grounds site, just off the U. S. Highway No. 1, and when all of the buildings are completed, will be an up-to-date, attractive camp. This camp is so located that they have the advantage of city lights and water, and the men who will be stationed here will have very comfortable and adequate living quarters.

There is enough work in Emanuel coun-

ty to keep this sixty man camp busy for approximately twelve months. To date, no primary firebreaks have been constructed on the T. P. O. land by CCC labor. The T. P. O. constructed some two hundred miles of secondary firebreaks during the past winter and spring, and when this work is supplemented, by a system of primary firebreaks, the landowners will receive more protection on their timbered lands.

Grader Constructed Firebreaks

Since we now have a grader at most of the camps operating in this district, we are using them practically altogether in firebreak construction.

Before we had the use of the graders, all firebreaks were constructed with a Case-Wheatland plow. A firebreak of this type is very good, but will not compare with firebreaks constructed by using a grader. The advantages of grader constructed firebreaks over the plowed ones are as follows:

There are two ditches one on each side of the firebreak that will keep it well drained and useful as a road, greatly aiding fire-fighting crews to get to a fire, after it has been reported.

The initial cost of grader constructed firebreaks is a little higher than the ones that are plowed, but the maintenance cost will be much less for the grader constructed firebreak, as they can stand at least two years without any great expense for maintenance, where the ones constructed with the plow must be replowed each year.

EIGHTH DISTRICT

**H. D. Story, Jr., Dist. Forester
Albany, Ga.**

Due to a seed shortage this past fall, only a limited quantity could be purchased for planting in the state nursery located at Albany, but those planted germinated well and promise to develop into thrifty planting stock to be distributed to land owners over the state.

The demand for planting stock is increasing and has been so great that orders taken for last fall's planting had to be postponed in order that those who placed orders could be furnished a share of the supply.

The nursery is receiving orders almost daily from land owners who want to plant large tracts, and it is likely that orders will have to be postponed again this year.

Nursery Dwelling Ready

The nurseryman's dwelling at the Albany nursery has been completed and is ready to be occupied. It is made of logs, coiled with "pecky" cypress, provided with all conveniences and presents an attractive appearance both inside and outside.

Misread the Figures

Foresters' figures are not always confined to "believe it or not" statements. In one respect, the forest ranger's figures are as witnessed by the following: A T. P. O.

member had 250 acres of land listed with the examination and his quarterly assessment was 34 cents. It so happened that when the secretary, assisted by the regularly employed padman, made out the card notifying the assessor of the assessment, he set the amount down at \$0.34.

Now the strange part of this story is that the owner was so interested and impressed with the protective work that he made a mistake in reading his assessment and mailed in a check for \$80.34.

CATOR WOOLFORD HONORED FOR PARK DONATION

On June 20, the citizens of Brunswick tendered a testimonial dinner of appreciation to Cator Woolford, Atlanta, for his donation to the state of the site for San Domingo state park, the first state park to be established on Georgia's seacoast, and the first to memorialize the early Spanish history of Georgia. On the park property, near the mouth of the Altamaha river, are the remains of a Spanish mission and fortress constructed between 1600 and 1610.

It was a memorable occasion attended by prominent citizens from various parts of Georgia and from Washington. Among those who spoke were United States Senator Walter F. George; Ivan Allen, Atlanta; Alfred Newell, Atlanta; M. B. McKinnon, Brunswick; Howard Coffin, Sea Island Beach; L. W. "Chip" Roemer, Washington, D. C.; Alfred Jones, Sea Island Beach; a representative from Robert Fechner's office, Washington; and, of course, Cator Woolford, Atlanta.

NEW CCC ENROLEES BEGIN CAMP EMPLOYMENT

Enlisted men who had been employed on CCC camps for one year are to give up their positions in July to new men on the waiting list.

Efficiency will, of course, slump until the new men learn their jobs, but a higher degree of efficiency is being obtained than was possible when the first groups of men went to work. They, too, were new and inexperienced and generally equipped with little. Now, the supervising personnel is trained as well as a nucleus of enrolled men, equipment is adequate, and work is planned. As a consequence, much more work may be accomplished from the third six months than the first.

Over 4000 Georgians were called for to fill in camp vacancies. Many more were ready to enlist.

According to estimates made by experts in Washington, the demand for lumber in 1934 will be between 30 and 35 billion board feet, or about what it was in 1933.

SWIMMING AND FIRST AID BY RED CROSS EXPERTS

Vocational Forestry Camp Boys Get Training This Year Through Splendid Cooperation of Red Cross.

Through the generous cooperation of the Red Cross Society, the vocational forestry camp boys are this year receiving the benefits of expert training by Red Cross men, assigned by the regional office of this organization. Arrangements were made for this service through Stone J. Crane, Atlanta, a regional director. He assigned to the camp J. H. Kinney of Moultrie and S. P. Lane, trained at brevard, North Carolina. Both rank high in this type of Red Cross work. They are giving daily instruction in swimming for the three weeks duration of the camp.

It is hoped that this arrangement can become a permanent feature of the forestry camp and that the training which each boy receives during his six weeks camp of two summers, will be such as to make them efficient not only as swimmers, but qualify them for life saving and first aid work in their respective communities.

BLUE STAIN NOT FACTOR IN PINE PULP MANUFACTURE

Information sent out from Savannah quotes Dr. Charles Herty to the effect that pine wood put in storage under conditions that developed blue mold or stain, has developed beautiful white paper under the usual 25 per cent introduction of sulphite treated pulp.

This has apparently solved what at one time was thought might prove a serious problem in using stored pine wood for making paper. The first step taken to avoid blue stain was to use fresh cut wood in which blue stain had not had time to develop. The use of fresh wood proved entirely satisfactory. It was not until recently that the Pulp and Paper laboratory attacked the problem of handling stained wood, with the result mentioned. Therefore, the blue stain bugaboo has been routed.

Another significant statement that Dr. Herty has put out is that trees that have grown since the pine forests were cut in the 90's are suitable for making pulpwood. In other words, investigations are revealing that trees with some heartwood can be used for pulpwood. This means that practically all pine trees in the south are suited to making white newsprint paper.

GEORGIA'S STATE PARKS DEVELOPING WITH ECW AID

Places of Beauty and Recreation Coming Into Existence With CCC Labor and Under the Guidance of Skilled Landscape Architects

Visit Indian Springs State Park, Vogel State Park, Alexander H. Stephens Memorial Park, Fort Mountain State Park, San Domingo State Park and Pine Mountain State Park and you will find crews of CCC men busy developing plans for beautifying and improving these park areas.

The parks at Indian Springs, Vogel Park on the Blue Ridge in Union county and Stephens Memorial Park at Crawfordville have more to show of accomplishments for the reason that work on them has been in progress for a year. Visitors will find roads, trails, buildings, bridges and landscaping for their enjoyment, and may visualize how the parks will appear when completed.

At Fort Mountain Park near Chatsworth, San Domingo Park near Brunswick and Pine Mountain near Warm Springs, work has been in progress only a short time. Visitors are welcome to visit the camps, observe the progress, the park sites and the plans for their development.

One other state park site on which no work has yet been done is at Cloudland in northwest Georgia. Here visitors will find natural beauty worth seeing, as well as the beautifully developed resort area nearby.

One or more state parks to serve other parts of the state are expected as a statewide park system is developed.

Careful consideration is given by skilled landscape architects to each park site with the purpose of making Georgia's parks second to none for beauty and fitness to surroundings. Mrs. M. E. Judd, State Park Authority and member of the Commission of Forestry and Geological Development of the State, is earnestly devoting her time and talents to this great undertaking.

Erosion Work Popular Farmers Demanding Increase

According to H. H. Bennett, Washington, in charge of the expenditure of \$10,000,000 on soil erosion demonstrations, the projects have been tripled in scope through the cooperation of farmers. Instead of the eight projects it has grown to 24 and may be increased.

One of these projects is located on Sandy creek in Clarke county, Georgia. Mr. Bennett quotes from a letter written him by Dean Paul Chapman of the State College of Agriculture, Athens, as follows:

"Soil erosion work has caught the interest of our people as nothing else. Delegations of dozens of farmers have presented petitions for the extension of the Sandy creek control project. This was their own idea."

REGIONAL FORESTRY SCHOOL HOPE GEORGIA UNIVERSITY

Scholarships Available to Students From Other States—Survey Committee Recommends Georgia.

A National Survey Committee reports that there are too many forestry schools in the United States, that there is a lack of an outstanding school in the South, and that Georgia is the logical place to build up such a school in this section.

The Board of Regents of the University System has accepted the responsibility and has authorized a number of forestry scholarships to southeastern states. It is learned that over a hundred inquiries have come to the forest school from persons outside of Georgia, indicating that already this oldest training school for foresters in the south is looked upon with general favor.

Those desiring scholarships can get information by writing G. D. Marckworth, Professor of Forestry, University of Georgia, Athens. A recently prepared announcement of the school will also be received.

YIELDS EFFECT OF THINNING APPALACHIAN HARDWOODS

The yield of timber on a thinned hardwood area at Berea, Kentucky, for a period of ten years, as shown by the Appalachian Forest Experiment Station, has been 182 board feet per acre per year, as compared to an uncut comparable area of only 97 board feet. This indicates why the Lumber Code calls for harvesting in a way to promote sustained yields.

The average stand of the cut area in trees 12 inches in diameter and above was 6,887 board feet. It was reduced by logging to 1,237 board feet per acre. The growth in ten years brought the volume up to 3,063 board feet, or an average net annual growth of 183 board feet per acre.

The uncut area had an average stand of 5,141 board feet per acre, but its average annual yield per acre for ten years was only 97 board feet.

Basswood, red oak, sugar maple, hickory and white ash made up 75 per cent board foot volume of the original stand.

For the more rapid growth species of trees, such as pines and yellow poplar, of course, the annual growth rate per acre would even more justify thinning or harvesting for sustained yields.

Ideal of Sustained Yields

Whether they like it or not, the lumber manufacturers are now embarked on a conservation program which is designed to embrace the development of all the timber remaining in this country. They are pledged to do certain definite things for the purpose of protecting the young trees and encouraging additional timber growth. In general

(Continued on Page 8, Col. 3)

"Nikola Tesla has an invention that will destroy 10,000 air planes 200 miles away, but nobody is able to invent anything that will kill three mosquitoes on a sleeping porch." Southern Lumberman.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

VALUE OF MINERAL PRODUCTION OF GEORGIA FOR 1932

by

RICHARD W. SMITH and LANG MITCHELL

The value of the mineral production of Georgia, including water power, for 1932 was \$16,727,365. Although this figure is less than the value reported for 1931 (\$22,147,447), the excessive deflation of the period caused cessation of many mining activities and a general decrease in value of the production. A comparison of values of 1931 and 1932 reflects the nature of the mineral. Industrial minerals, used by large industries in large amounts, such as clay, iron ore, barite, etc. showed large decreases in production and value. Materials which bring a high price for small amounts such as gold mica, slate, etc. showed gains in production and value for 1932.

Greater activity in 1933 is revealed by a few preliminary reports which have been received, and it is expected that the production in 1934 will show a considerable increase.

The collection of the statistics of the mineral production of Georgia is undertaken by the United States Bureau of Mines and the United States Bureau of Census, with the cooperation of the Division of Geology of the Georgia Department of Forestry and Geological Development. The gathering of this information is a slow process, as many firms do not report their productions until considerable time has elapsed.

The completed summary for 1932, together with notes on the uses of the various minerals, and a comparison of the figures with those of 1931, is given in Table I below. The statistics for minerals of which there are less than three producers in Georgia are confidential and cannot be revealed. These minerals are marked below, with an asterisk (*) and their values have been reported in combination with other such minerals so as to conceal individual values.

Asbestos: Short fiber asbestos, used for insulating purposes and for the manufacture of asbestos shingles, was mined only in White county.

Barite: Barite is a heavy white material

used largely in the manufacture of lithopone for use in paint. It is also used in the manufacture of barium salts, in the refining of sugar, in glazing pottery and enameling iron, and as a filler in the manufacture of paper and rubber. All of the 1932 production came from the Cartersville district of Bartow county.

Bauxite: Bauxite, the oxide of aluminum, was first discovered in America in 1887 near Rome, in Floyd county, Georgia. Since that time it has been mined in Floyd, Bartow, and Polk counties in Northwest Georgia and in Wilkinson, Macon, Schley, and Sumter counties in middle Georgia. The only bauxite mined in 1932 came from Sumter county and was largely used in the manufacture of alum salts for use as a water conditioner.

Portland Cement: Portland cement was manufactured from limestone and either shale or clay at two plants in Polk county and one in Houston county.

Clay (Kaolin): Georgia produces over half of the kaolin mined in the United States for use as a filling and coating clay in the manufacture of paper; as a filler in the manufacture of rubber, oil cloth, and other products; and for use in the manufacture of china and other white ware. Sedimentary kaolin was mined in the following counties, named in order of the value of production: Wilkinson, Twiggs, Richmond, Hancock, Glascock, Houston, and Taylor. The tonnage produced decreased only slightly from that of 1931, but as the value per ton at the mine decreased from \$6.00 in 1931 to \$5.00 in 1932, the total value decreased markedly.

Clay Products: The value of the products manufactured from clay in Georgia probably amounted to about a million dollars. These products include fire brick and other refractories manufactured from the sedimentary kaolins of the Coastal Plain; common and face brick from the alluvial clays of Middle Georgia; and sewer pipe, structural and roofing tile, and common and face brick from the shales of northwest Georgia.

Coal: Only one coal mine is in operation in Georgia, that of the Durham Land Company on Lookout Mountain in Walker county.

Fullers Earth: Fullers earth is a variety of clay used mainly in refining oils. That produced in Decatur county is used with mineral oils, whereas that mined in Twiggs and Wilkinson counties is used mainly with vegetable oils.

Gold: The value of the gold produced in 1932 was \$5,709 as against only \$1,827 in 1931. This increased activity in gold mining was due largely to the depression. It is expected that the production in 1933 will show a considerable increase over 1932. The 1933 production has been greatly stimulated by the drop in the price of the dollar.

TABLE I
VALUE OF THE MINERAL PRODUCTION OF GEORGIA FOR 1932

Material	1932 Value	Change from 1931 Value
Marble	\$1,551,752	Over 50% decrease
Granite	1,340,047	34% decrease
Clay	1,197,078	28% decrease
Clay Products†	1,000,000	
Bauxite*		Over 50% decrease
Fullers Earth*	1,569,882	Slight decrease
Portland Cement*		40% decrease
Limestone, Lime	503,932	
Asbestos		27% decrease
Slate		23% decrease
Mica	160,645	60% decrease
Chlorite Schist*		7% increase
Sand and Gravel	127,655	Mica and Chlorite Schist
Barite		Over 900% increase
Other		38% decrease
Manganese*	218,509	37% decrease
Coal*	49,526	Slight decrease
Iron Ore*		46% decrease
Gold	5,769	Slight increase
		97% decrease
		216% increase
TOTAL	\$7,724,795	
Water Power	9,002,570	
GRAND TOTAL	16,727,365	

Less than three producers, so value of production cannot be shown separately.
† Statistics for value of Clay Products are collected by the U. S. Bureau of Census only in odd numbered years. The value given above is an estimation based on the value reported for the previous year.

Granite: The ten counties producing granite in 1932 are in order of the value of their production: DeKalb, Elbert, Warren, Madison, Henry, Pickens, Greene, Oglethorpe, Hancock, and Dawson.

Iron Ore: Iron ore was mined in 1932 by only one company, in Floyd county.

Lime and Limestone: The only plant reporting a production of lime in 1932 was in Bartow county. The eight counties producing limestone, in order of the value of their production, are: Houston, Gilmer, Hall, Pickens, Bartow, Chatooga, Polk, and Crisp. The larger part of this production was used as a road material, but limestone, both crushed and ground, was used for many other purposes.

Manganese: Two companies in the Cartersville district of Bartow county reported a production of manganese ore in 1932.

Marble: The Georgia Marble Company, with quarries in Pickens and Cherokee counties, was the only producer of marble in 1932.

Mica and Chlorite Schist: A very small production of punch and sheet mica was reported from Elbert county in 1932. Chlorite schist, used principally as a filler, was reported from Cherokee county and showed a large gain in production.

Ocher: Ocher, a hydrated iron oxide used in the manufacture of linoleum, oil cloth, and as a coloring for mortars, was produced by two companies in the Cartersville district of Bartow county.

Slate: Roofing slate and slate granules for the manufacture of artificial roofing were produced in Bartow and Polk counties.

Talc: Two companies near Chatsworth in Murray county reported a production of ground talc and talc pencils.

Water Power: The amount of electricity for public use generated by water power in Georgia in 1932 amounted to 900,257,000 kilowatt-hours, as compared to 680,928,000 kilowatt-hours in 1931. The 1932 production, figured at one cent per kilowatt-hour, gives a value of \$9,002,570. The method of calculating the value of the water power was changed in this table from that of other years, this fact accounting for the apparent decrease in the value. Actually, 1932 showed a greater production of electricity from water power than did 1931. The rate of one cent per kilowatt-hour as a value for electricity at the source of production was believed to be more consistent with the value of minerals at the mines. In previous years, the rate as delivered to consumer had been used.

INVESTIGATION OF THE KYANITE, VERMICULITE, AND OLIVINE DEPOSIT OF GEORGIA BEGUN

The investigation of the kyanite, vermiculite, and olivine deposits of Georgia by the United States Geological Survey, in co-

operation with the Georgia Division of Geology, was begun on July 16th, according to the State Geologist Richard W. Smith. The work is in charge of Mr. Louis M. Prindle of the United States Geological Survey, a geologist of wide experience in Alaska and in the East, where he has been working with rocks of the same geologic age as those of north Georgia. He is assisted by Mr. Charles F. Greene of Atlanta, a graduate of the Georgia School of Technology.

Mr. Prindle will first map the areas of kyanite-mica schist in Habersham and Rabun counties where kyanite is already being mined and shipped to the manufacturers of highgrade fire brick and other refractories. These manufacturers grind the kyanite and add it to the mixtures from which the refractories are made. On firing such mixtures, the kyanite recrystallizes and forms a mass of interlocking crystals which add greatly to the strength and heat resistance of the refractories. Deposits of massive kyanite in Union, Fannin, Gilmore, Cherokee, and other counties will later be examined.

Mr. Prindle will also examine the deposit of vermiculite and olivine recently discovered in Rabun, Towns and other counties. Vermiculite, a bronze-colored hydrous mica which swells on heating to a light fluffy powder, is now being mined just across the Georgia line in North Carolina for use as a heat-insulating material in houses, refrigerators, and air-conditioned Pullman cars, and as a bronze pigment in inks and paints. It is usually found associated with a massive granular green mineral called olivine which has recently been used as a refractory in the manufacture of basic open-hearth steel. It is expected that this investigation will result in the commercial development of these minerals in Georgia.

State Geologist Smith states that the Georgia Division of Geology, 425 State Capitol, Atlanta, Georgia, has just published an information circular describing these minerals and their uses. A copy of this circular will be mailed to anyone interested on receipt of a two-cent postage stamp.

Durability of Wood

Evidences of the durability of wood continue to present themselves. A general knowledge of the fact that there are wooden temples in Japan over a thousand years old and wooden dwellings in Scandinavia and Russia known to be over 600 years old, eclipses, in a measure, interest in structures of lesser antiquity. Yet these are worthy of attention.

In a recent edition of the *London Star* appears an illustration showing the last stages of the demolition, at Davenport, of the hull of the old flagship *Delaware*. The story accompanying the illustration declares that the work has taken much longer than anticipated. "Owing to the difficulty in

breaking up the old timber, which is just as sound as ever after 100 years."

A writer in a recent issue of the *American Building Association News* calls attention to the dance floor still intact in the old Orleans Theatre in New Orleans. Made of 3 inch cypress, it has withstood not only the wear of the thousands of feet which slipped over its surface in the course of the mad masked balls of the decades long preceding the Civil War, but the action of the elements throughout the years as well.

M. D. Mobley, assistant supervisor of vocational agricultural education in Georgia, formerly located at Tifton, has been transferred to the office of M. D. Collins, state superintendent of education, at the State Capitol, at Atlanta.

Mr. Mobley has been the efficient camp manager of the vocational forestry camp and in this and other cooperative forestry educational work, has teamed efficiently with the Georgia Forest Service.

There are more than 50 kinds of insects that injuriously attack trees in the northeastern United States. They include seven wood borers, 25 leaf-feeders, and 19 sucking insects.

There are three graduate forest schools in the United States and 26 undergraduate schools. Canada has four forest schools.

"Well stranger, I'm the mayor of these diggin's and I am for law enforcement. We've got an ordinance what says no dance hall shall be nearer than 300 feet from church. I given 'em three days to move the church."—The Southern Lumber Journal.

"You see that girl? She's just got \$2,000 for a short love story."

"Good heavens, that's a lot of money for a short story. Did she sell the cinema rights?"

"No, she told it to a jury."—The Southern Lumber Journal.

Ideal of Sustained Yields

(Continued on Page 8, Col. 3)

they will be required to follow practice designed to promote the ideal of sustained yield.

The fact that should not be overlooked, however, is that the obligations in this new forestry program are not entirely on the side of the lumbermen. The public (Who is just another name for the government) undertakes certain duties too. There is to be set up a nation-wide forest fire protection organization, there is to be evolved an equitable system of forest taxation, and there are hopes for a forest credit system which will facilitate the carrying of standing timber over long periods of time. —Southern Lumberman.

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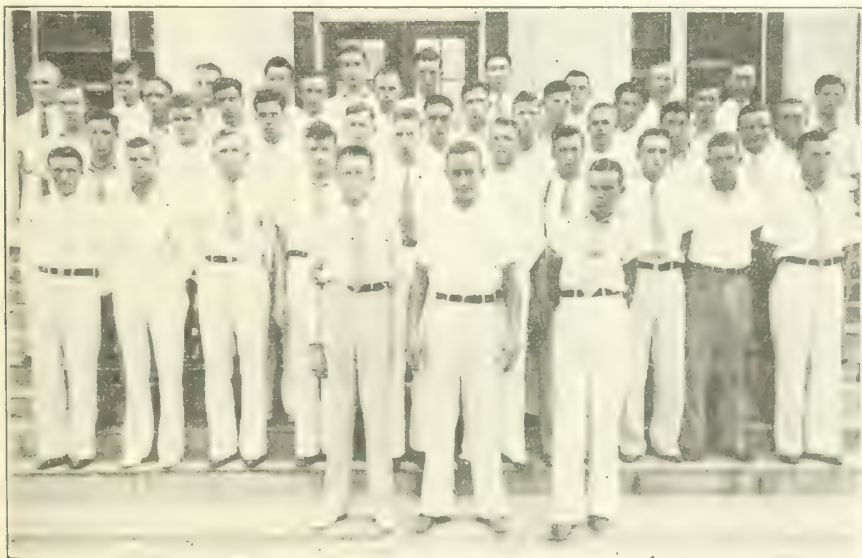
FOURTH VOCATIONAL FORESTRY CAMP SUCCESSFULLY CONDUCTED

Forty-three Young Men Given Certificates of Vocational Forester by Georgia Forest Service at Camp held at Abraham Baldwin College—Several Noted Speakers Heard—First Year Students Fine Class of Young Men and Promise to Maintain High Standard the Camp Has Established

The fourth annual Vocational Forestry School Camp, conducted cooperatively by the Georgia Forest Service and the State Department of vocational agricultural education, was held July 16 to August 4 at Abraham Baldwin College at Tifton, and for forestry training was probably the best yet held.

Forty-three high school boys from rural consolidated high schools in all parts of the state, successfully completed their six weeks course in practical forestry and received certificates of Vocational Forester. This certificate recommends the holder to be qualified to do non-technical forestry jobs. As a result of their forestry work in high school and forestry camp, these boys have learned the names and how to identify the trees of Georgia; they have learned how to survey and estimate the volume of standing trees in a forest; how to harvest and market timber; the uses of woods; how to gather, care for and market tree seed; how to operate tree seed beds, grow seedlings and plant them; how to manage a forest for larger yields of timber and naval stores products; how to protect the forest from fire and how to thin and improve forest growth. As a result of this instruction,

(Continued on Page 2, Col. 1)



**GROUP OF STUDENTS RECEIVING CERTIFICATES OF
VOCATIONAL FORESTER, VOCATIONAL FORESTRY CAMP, 1934**

First row, left to right—Elmon Vickers, Moultrie, vice president; Lee Sasser, Rayle, President; Paul Jones, Elberton, Secretary. *Second row*—Jim Hulsey, Dawsonville; Ashley Whitehurst, Adel; J. L. Spence, Waresboro; Robert Smith, Lorane; Sam Loyd Whitmire, Eastanollee; J. W. Donaldson, Register; Paul Raby, Rabun Gap; Ralph Johnson, Winder; Alton Hodges, Ludowici; Calvin Ellington, Summit. *Third row*—Wilber Blount, Vidalia; Elton Riner, Kite; Farris Carlan, Homer; O. M. Cates, Meigs; Huell O'Kelley, Danielsville; Edwin Lloyd, Stockton; Bill Oliver, Martin; Farrell Russell, Calhoun; Oswell Smith, Waresboro. *Fourth row*—John Broadwell, Alpharetta; Perry Foster, Leslie; Woodrow Osborn, Ellijay; Shad Calloway, Hogansville; Solon Owensby, Franklin; J. H. Holloman, Richland; Barron Cochran, Girard; Virgirie Coleman, Eastman; Teeny Floyd, Fitzgerald; I. J. Medders, Sylvester. *Fifth row*—Charles Head, Chamblee; Austin Avery, Adrian; Billy Garrett, Butler; Tom Strickland, Dalton; Tharan Connell, Pavo; Dorsey King, Lavonia; Homer Winkle, Armuchee; Russell Willis, Ty Ty; Eugene English, Clarkesville; Render Rowe, Carrollton; Oliver Anderson, Wrens.

PINE GROWING INDUSTRY GIVES ENCOURAGING RESULTS

Area of 16,000 Acres near Stockton Protected from Fire and Thinned, Develops Rapid Growing Pines of Great Commercial Possibilities

In a recent issue of the Valdosta Times appeared an article telling of the encouraging progress made in growing pines on a 16,000 acre tract near Stockton, Georgia, and giving an interview with E. H. House, one of the owners. The operating company is known as Slash Pine Farms, Inc., the owners being J. C. Marsh & Sons, Winfield, Florida; H. M. Wilson, Jacksonville, Florida; and E. J. House, Stockton, Georgia.

The company is a member of the Consolidated Timber Protective Organization. It has its own fire fighting equipment and every man on the place is a trained fire fighter. On the area 239,000 miles of fire-breaks have been constructed, and as a fire control measure the company has cut out all bad trees and lightwood stumps.

Keeping cut fires has resulted in natural reforestation over much of the area. Where the growth has become too thick, Mr. House has thinned to a spacing of about 15 feet with a view to having about 200 trees per acre, the number he considers best for naval stores production. At the time at which the trees are now growing, it is thought they will be ready for chipping when they are 12 to 14 years of age.

Some planting has been undertaken. Forest seedlings transplanted in 1932 are now 15 to 16 feet high, 4 to 5 inches in diameter, and are adding height growth at the rate of 2 1/2 to 3 feet a year.

Seedlings from the previous year also been planted under poor weather conditions, but in the tract thus planted he has trees showing an unusual rate of growth.

From data which Mr. House has gathered from a 50 acre tract with 200 trees per acre, he estimates that 16 crops of 10,000 cups each can be obtained. On another portion of the tract he estimates 10,000 cups, or 16 crops of cups.

Quoting Mr. House: "We make trees that are burning records in development of young trees in spite of all possibilities which we can take. To any man who cares to approach the matter of growing

(Continued on Page 8, Col. 1)

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and Secretary of Commission Atlanta
C. A. Whittle, Educational Mgr. Atlanta
H. M. Sebring, Asst. State Forester, Atlanta
E. B. Stone, Jr. Dist. Forester Gainesville
C. B. Beale, District Forester Waycross
W. D. Young, District Forester Rome
Jack Thurmond, District Forester, Savannah
C. N. Elliott, District Forester Augusta
H. D. Story, Jr., District Forester Albany
W. G. Wallace, District Forester Columbus
Mrs. N. N. Edwards, Secretary Atlanta
Mrs. R. S. Thompson, Treasurer Atlanta

Geological Division

R. W. Smith, State Geologist Atlanta
G. W. Crickmay, Asst. State Geologist, Atlanta
Lane Mitchell, Asst. State Geol. Atlanta
Miss Margaret Gann, Clerk Atlanta

Extension Foresters

Bonnell Stone, Chairman, Oxford
Dupre Barrett, Athens
K. S. Trowbridge, Tifton

VOCATIONAL FORESTRY CAMP

(Continued from Page 1)

these young men are capable not only of managing their forests successfully, but are qualified to become forestry leaders in their communities.

Abraham Baldwin College proved in many respects an ideal place for the camp. The program of work fits in with the vocational objectives of the college. President George King and his able faculty cooperated in every way to make the camp a success. The college is to introduce a course in practical farm forestry this year with George Moseley as teacher. Mr. Moseley assisted in carrying on camp work.

The City of Tifton extended assistance by providing free use of the city swimming pool for instruction given this year to camp students in swimming and life saving. The city assisted in transporting students on their Saturday trips, and various organizations of the city extended courtesies and entertainment to the staff.

The new feature of the camp—swimming and life saving—was made possible by the cooperation of the American Red Cross Society, which assigned two splendid instructors, J. H. Kenney of Moultrie and S. P. Lane of the University of North Carolina. Several of the camp students won merit badges and highly appreciated the opportunity.

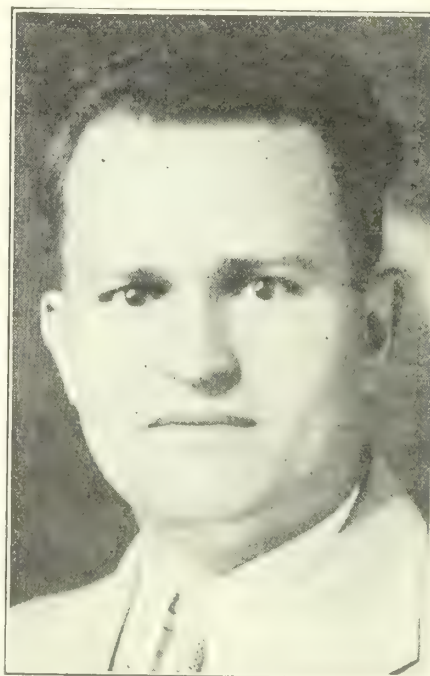
The staff this year consisted of C. A.

Whittle, director and lecturer on utilization; M. D. Mobley, Atlanta, camp manager; C. N. Elliott, district forester, Augusta, dendrology; H. D. Story, Jr., district forester, Albany, silviculture; W. D. Young, district forester, Gainesville, surveying and mensuration; W. G. Wallace, district forester, Columbus, surveying and mensuration; Russell D. Franklin, district forester, Rome, silviculture; George Moseley, Waycross, silviculture; K. S. Trowbridge, extension forester, Tifton, naval stores practices; Mrs. M. D. Mobley, Atlanta, camp secretary.

The vocational agricultural teachers attending the camp and assisting in instruction in athletics and camp management were: J. N. Young, Armuchee; H. L. Simpson, Plains; Claude Bray, Hogansville; C. O. Parker, Carnesville; C. H. Barker, Gore; W. C. Britt, Snellville; T. G. Walters, Moultrie. Others made brief visits.

Prize Winners

The vocational teacher winning the Herty prize of \$75 given by the Georgia Forestry Association in honor of Dr. Charles H. Herty, was P. L. Elkins of the Milton High School at Alpharetta, for doing the best work in forestry for the school year 1933-34. This prize was awarded by T. G. Woolford, Atlanta, president of the Georgia Forestry Association on the night of August 3rd.



P. L. Elkins, Alpharetta, Winner Teacher's Herty Prize, for Best Work in Forestry—School Year 1933-34.

In accepting the prize, Mr. Elkins stated that it should go to the boys who helped him win the prize, and would be spent on the construction of a forestry cabin. To this end, he handed over the check to John Broadwell, student of his school.

The teacher who was a close second in the contest was J. D. Davis, of Pavo, with R. E. Tanner, Summit, as third.



Elmon Vickers, Norman Park, student of Moultrie High, Winner Student Herty Prize

The winner of the student "Herty prize" was Elmon Vickers, Moultrie High School, who made the highest grade in two successive forestry camps. A second prize of \$25 was awarded to Shad Calloway, Hogansville, who was a close contestant for first prize. Students who averaged 90 and above were: Tharan Connell, Pavo; Homer Winkle, Armuchee; Sam Loyd Whitmire, Eastanollee; Austin Avery, Soperton; Billy Garrett, Butler; O. M. Cates, Jr., Meigs.

Public Addresses

State Geologist Richard Smith made an interesting talk on how hills, valleys and plains were formed. The boys eagerly seized the literature he brought for distribution.

Lenthal Wyman, Lake City, Florida, for 13 years a research worker of the U. S. Forest Service in forest phases of naval stores production, addressed the group at night and gave two classroom lectures. The students showed keen interest and asked many intelligent questions.

M. D. Collins, state school superintendent, gave an inspiring and eloquent address that brought the students swarming around him at its close.

L. M. Sheffer, assistant director of vocational agricultural education, made an instructive and practical address, showing the need of forestry education in vocational schools.

Senator Susie Moore, Tifton, spoke to the boys at Chapel, telling of her interest in vocational education and of the objectives of Abraham Baldwin College.

County School Superintendent of Education M. L. Harman of Tift county gave the boys helpful advice.

Marion Renfro, Quitman, pioneer in cultivating or intercropping pines with co

and a student in camp, told of his pine project.

At the opening exercises the speakers were president George King of Abraham Baldwin College, Miss Kate Hollingsworth, secretary of the Chamber of Commerce, and Editor John G. Herring of the Tifton Gazette, and A. S. Bussy, assistant state club agent, Tifton.

G. D. Marckworth, head of the School of Forestry, University of Georgia, told the students that the demand for foresters now is greater than ever and promised to continue.

At the closing exercises President George King gave his impressions of the camp, and was followed by State Forester B. M. Lufburrow, who spoke interestingly about the forestry project in the school, the success of boys who had finished their camp work, and presented certificates to the class completing its work.

T. G. Woolford, President of the Georgia Forestry Association, gave an able exposition of the status of forestry and its outlook; advocated individual rather than government development of forest resources; called attention to the reversal of ideas about forestry and urged the boys to undertake to reveal new forestry facts. At the close of his address he awarded the teacher's Herty prize to P. L. Elkins, Alpharetta.

Judge G. Ogden Persons, Forsyth, vice president of the Georgia Forestry Association, made an eloquent and informative address on the genius of invention and adaptation in dealing with the commonplace. He pointed to Dr. Herty's discoveries of new uses for pines that are common to every farm. At the close of his address he presented first and second student prizes to Elmon Vickers, Norman Park and Shad Calhoun, Hogansville.

Initiation and Stunt Nights

Two nights were given to fun. The initiation of first year boys by the second year boys was a public affair and carried out at the college arena. The first year boys did the various things required of them in good sportsmanship and provided lots of amusement for spectators.

Stunt night was even more fun provoking. A great variety of spectacular and ridiculous acts kept the audience in a roar of laughter.

Week End Trips

The first Saturday was given over to a visit to the famous Sea Island Beach at Brunswick, where the management of the beach extended unusual courtesies to the boys. Most of the boys had never seen the ocean, and did they enjoy it? The effect of the seashore is another story.

The second Saturday was devoted to a trip to Crystal Lake in Irwin county, a beautiful lake ideal for swimming and boating. Here the management also accorded the boys special privileges.

Resolutions

At the closing exercises a committee of

students consisting of O. M. Cates, Jr., chairman, Lee Sisson, president of the 1934 class, and Max Looper, president of the 1935 class, presented resolutions in which they thanked the Department of Forestry and Geological Development for financing the camp and asked continued support; thanked the Tifton Board of Trade for the use of the swimming pool and other courtesies; expressed gratitude to the Coastal Plains Experiment Station for assistance; thanked the American Red Cross Society for providing instructors in swimming and life saving; spoke appreciatively of the kindness of the management of Abraham Baldwin College and of courtesies of the summer students of the college; and declared a deep appreciation of the prizes offered by the Georgia Forestry Association.

List of Students Receiving Certificates

The names of vocational agricultural students who completed two summer sessions of forestry work and received certificates of vocational forester are as follows: Billie Garrett, Butler; Farris Carlan, Homer; Robert Smith, Lorane; Ralph Johnson, Winder; J. W. Donaldson, Jr., Register; Barron Cochran, Girard; Render Rowe, Carrollton; Homer Winkle, Armuchee; Elmon Vickers, Norman Park; Ashley Whitehurst, Adel; Jim Hulsey, Dawsonville; Chas. Head, Chamblee; Paul Jones, Middleton; Calvin Ellington, Summit; John Broadwell, Alpharetta; Bill Oliver, Martin; Woodrow Osborn, Ellijay; Harrell Russell, Calhoun; Eugene English, Demorest; Dorsey King, Lavonia; Solon Owensby, Franklin; Teeny Hardwick Floyd, Ocilla; Oliver C. Anderson, Matthews; Elton Riner, Kite; Edwin Lloyd, Stockton; Virgirie Coleman, Plainfield; Alton Hodges, Ludowici; O. M. Cates, Jr., Meigs; Huell Brand O'Kelly, Danielsville; Paul Raby, Rabun Gap; J. H. Holloman, Richland; Perry Foster, Jr., Leslie; Tharan Connell, Pavo; Russell Willis, Ty Ty; Wilber Blount, Vidalia; Shad Calhoun, Hogansville; Austin Avery, Adrian; J. L. Spence, Waresboro; Tom Strickland, Dalton; Lee Sisson, Rayle; I. J. Medders, Sylvester; Sam Loyd Whitmire, Eastanollee; Oswald Smith, Waresboro.

CAMP NOTES

A student receiving honorable mention for community work in promoting forestry was O. M. Cates, Jr., Meigs, a student of the high school at Sale City.

The second year boys sent a resolution of esteem and sympathy to Hon. Bonnell Stone, Oxford, whom they chose as class counselor while they were first year students. Mr. Stone was unable to attend the camp this year.

Mrs. Claude Gray, wife of Dr. Gray of the college, played the piano for camp songs. As a token of appreciation Mrs. Gray was presented a gift on the last day.

Musicians of Tifton put on a program for

one night. It was planned by Mrs. E. D. Fulwood. The program was greatly enjoyed.

A popular musician of the camp was W. D. Young, district forester at Gainesville. He was in great demand for songs and guitar selections. Other singers and banjo players were Lee Sisson and Eugene English. Jim (Jaybird) Hulsey subbed for C. N. Elliott as a song leader.

Camp food was excellent. Miss Creswell, domestic science teacher of the college, was acclaimed by the students on the last night of the camp for the excellence of the food.

An "Alma Mater" song was produced by C. N. Elliott and "sprung" on the camp for the first time stunt night. It was a "hit".

The champion pine grower, Marion Renfro, Quitman, was a student at camp through the kindness of Mrs. E. T. Comer, Savannah, who donated a scholarship. He made an excellent camp record.

Through the assistance of Director S. H. Star, Coastal Plain Experiment Station, the camp students were conveyed over the station farm and received explanations of the significance of the experiments being conducted.

Many of the students had their first opportunity of witnessing a tobacco market in operation. Tifton is an important tobacco center.

A deep sea fishing trip of C. N. Elliott and J. N. Young of the camp, bore fruit to the extent of 100 pounds of fish, which the camp found delectable. Sea sickness and hoarseness were incidentals of the trip.

Among the camp attendants were Mrs. C. N. Elliott and son, Charlie, Junior, Augusta; Miss Mary Mobley, Atlanta; Mrs. H. D. Story, Jr., and daughter Ida Marie, Albany; Mrs. W. D. Young, Gainesville; Mrs. Russell D. Franklin, Rome. Visitors included Mrs. B. M. Lufburrow and son, Burley Brown, Atlanta; County School Superintendent Owens of Sylvester; Eugene Adams, Norman Park; Miss Gray, eminent pianist of New York, daughter of Dr. and Mrs. Claude Gray, Tifton; Mr. and Mrs. W. B. Bates, Waresboro; George W. Dickinson, Bowman; vocational teacher Chapman, Ty Ty.

Speaking Contestants

O. M. Cates, Jr., Meigs, Ga., a vocational forestry student who won his certificate of vocational forester this year, also won first place in the state in the speaking contest of the Future Farmers of Georgia.

Other forestry camp students in the contest were J. W. Donaldson, Jr., Register, and Woodrow Ensley, Epworth.

FORESTRY QUESTION BOX

CONSERVING FERTILITY OF FOREST SOILS

ARTICLE 2

By C. A. WHITTLE

Is not the nitrogen in forest soils related to the organic matter in the soil?

Soil chemists have found that organic matter in soils is definitely related to the nitrogen content of the soil. Where there is little organic matter, there is little nitrogen and where there is much organic matter, such as is found in muck soils, the nitrogen content is high.

Burn over the forest soils and the result is that there is less organic matter. Keep fires out and there is more organic matter, and therefore, more nitrogen. Since most sandy or Coastal Plain soils have little organic matter, and therefore little nitrogen, nitrogen is the first limiting factor in tree growth as well as in the growth of agricultural crops on such soils. It therefore follows that if this scarce plant food element, nitrogen, is to be conserved, there must be no forest fires.

A nitrogen deficiency means the slowing down of tree growth, as was stated in the first article on this subject, for nitrogen has been shown by all soil investigators and botanists to function more strongly in vegetative growth, or the formation of wood growth, than any other plant food element.

As has also been said, it is true that the ash left by fires stimulates wild legumes to fix nitrogen in the soil and that ash also stimulates nitrification, that is, the transformation of the nitrogen of organic matter in the soil into available form for use in tree growth; but under the crown of a well stocked forest, legumes will not grow, and rapid nitrification of organic matter in the soil means rapid depletion of the soil's store of nitrogen, a scant store at best. This, taken with the loss into the air of the nitrogen existing in forest litter when the litter is burned, and the leaching loss increased by the burning of organic matter, means a poorer or later a richer nitrogen supply. In any well stocked forest on most Coastal Plain soils.

The inevitable conclusion is that fire is a depletor of soil nitrogen and never a conservator. As well well populated by trees, as land devoted to forest products should be.

Do burning off the woods of the Coastal Plain region of the South have any influence on the formation of hard pans in the soil?

The formation of hard pans is not well understood. A hypothesis of the Coastal Plain region is a leaching of minerals through chemical reactions. The ash left by fires is quickly dissolved in rainwater which readily carries the minerals of the ash down

through the sandy soils to a level where they "settle" or combine to form a stony mineral layer.

Iron is the chief cementer of hard pan materials and humic acid is considered a factor. Should humic acid be important in forming hard pans, one could mistakenly jump to the conclusion that the destruction of humus forming material by burning off the forest floor, would operate to reduce hard pan formation. This would be overlooking the dead roots of undergrowth, of seedlings and of saplings, killed by the fire. These are down in the soil and much better situated to form humic acid than the surface litter which is more quickly and thoroughly oxidized than sub-surface organic matter.

A soil with a hard pan is not an efficient forest soil. The roots often fail to penetrate the hard pan, and a shallow rooted tree is insecure against winds. In time of drouth, the trees suffer greatly because of the shallow earth in which the hard pan forces them to grow.

It is not claimed that hard pan will not form in the absence of fire, for leaching and hard pan formation in some coastal plain soils will occur regardless of fire, but it would be logical to conclude that the soluble mineral salts in ash left by fires and leached into the soil will hasten the formation of the mineral hard pan.

Many swamps and ponds in the non-limestone areas of the Coastal Plain are the result of hard pan formation. Perhaps the most notable instance is the 600,000 acre Okefenokee swamp which has been formed on a divide. The swamp feeds its waters to the Suwannee river flowing westward to the Gulf, and to St. Mary's river flowing eastward to the Atlantic ocean.

In areas underlain with marl or other lime formation, many of the ponds and lakes are lime sinks and are not primarily the result of hard pans.

Paper Mills and Saw Mills

From present indications, the proposed paper mills and the existing sawmills would, in the long run, be competitors in seeking to utilize the South's timber. But is this necessarily so? In the Scandinavian countries the paper mills and the lumber mills are operated side by side, the former using the limbs, tops and offal not used by the sawmills. Might not a similar arrangement be perfected in the South? Need the two industries be competitive from the standpoint of the supply of raw material? —Southern Lumberman.

Dr. Thomas E. Snyder, for several years connected with the U. S. Bureau of Entomology, has been assigned to the south to devote his entire time to forestry insects. His headquarters are with the Southern Forestry Experiment Station at New Orleans, La.

GIGANTIC SHELTER BELT GREAT PLAINS PROPOSED

The greatest tree planting proposal of this country is for a wooded windbreak 100 miles wide and 1,300 miles long, Canada to Mexico. Fred W. Morrell, in charge of public relations of the United States Forest Service, has been chosen to administer \$75,000,000 set up for the project and Dr. Raphael Zon, director of the Lake States Forest Experiment Station, has been assigned to handle technical phases of the work. Twelve federal tree nurseries are proposed, but contracts with commercial nurseries for the billions of trees required, is reported to be contemplated. The shelter belt will not be 100 miles of solid forest, but have strips of forests about 7 rods wide with a mile of farm land between the strips.

In news releases on the subject, the U. S. Forest Service calls attention to similar work begun 60 years ago on the steppes of Russia. Forest strips were planted as a protective measure against "black dust storms". Studies according to the U. S. Forest Service show that the wooded strips reduce the wind velocity 35 per cent during the summer and about 20 per cent in the winter. Evaporation of the land between the forested strips has been reduced 30 per cent and the yields of grain materially increased.

A thirty year old tree planting project by the U. S. Forest Service in western Nebraska on barren sand hills has yielded a forest. Windbreak plantings in Nebraska and Kansas, studied by the Forest Service show that they are effective in conserving soil moisture, preventing movement of soil by winds and in increasing crop yields.

Are Chestnuts Coming Back?

Public attention has been drawn to chestnut sprouts 4 inches in diameter and 20 to 25 feet high in Rhode Island that show no signs of chestnut blight. The disease has not yet been reported in the north, in the south, and the trees mentioned have survived in the presence of the disease in the region than it has been found in the south. It has, however, been noticed in Georgia that young, healthy chestnut trees resist the disease more effectively than the older trees.

It is probably too soon to say that new sprouts have acquired disease resistance to growing from root buds on a diseased tree or by getting, so to speak, a carry over antibody of resistance that parent trees developed. Building up resistance to disease would hardly be expected in a generation of trees, but of course everybody hopes that the unexpected may be true of the American chestnut.

A 100-acre forest nursery is being established near Jackson, Tennessee, by the Tennessee Valley Authority.

FIRST DISTRICT**Russell Franklin, Dist. Forester
Rome****ECW Items**

The road leading to Fort Mountain Park is showing the results of much hard labor expended in the past few weeks. It is a decided improvement over the road that was formerly used to get to the fort. The actual construction of the stone tower on top of Fort Mountain will soon be under way.

One of the CCC boys, working on top of Fort Mountain clearing brush, felt a gentle tapping on his leg just above the ankle and looked down to find that he was standing on a rattlesnake. It so happened that his foot was on the snake just behind the snake's head and it couldn't get a long enough stroke to sink the fangs in the boy's leg. All the boys are now wearing leather leggings and anything else that they can find to wrap their legs.

SP-6 is getting rather "sporty" in that a nice four hole golf course is nearing completion just outside the camp. The boys have been working hard on their course and some of them are fair golfers. (Page Charlie Elliott).

State Forestry Items

Several vocational schools have started their fall session during the past week, and are anxious to get started on their forest projects as quickly as the students can get settled and the late summer canning is completed.

The Gilmer County T. P. O. hopes to get two more towers started in the near future. This will give them a very adequate system of lookout towers, and will also enable them to connect with the U. S. Forest Service and its system of lookouts.

SECOND DISTRICT**W. D. Young, Dist. Forester,
Gainesville****Autoing to the Top of Enotah Bald**

It is estimated that 500 autos have been to the big spring near the top of Enotah Bald mountain in Towns county since the new truck trail was completed. A two-room breezeway cabin with kitchen has been constructed. At the end of the truck trail an area of about two acres has been fenced in from cattle and hogs, a picnic shelter has been constructed and an open air cooking furnace built. A number of people have taken advantage of the camping area afforded and claim that Bald mountain spring is the finest and coldest water in Georgia. Come and see for yourself.

**Abandoned CCC Camps Become
Relief Camps**

Camp P-79, Cornelia, was turned over to the FERA on the 15th of August together with three others in various parts of Georgia. This makes the second one in District 2 to be turned over to this Department of Government Relief.

**Prospective Vocational Forestry
Camp**

Plans are on foot to secure the camp site and buildings of P-73 near Hiawasseo, Georgia, for a permanent vocational forestry camp. This location is ideal as it is situated in the heart of the most rugged mountain country in Georgia at an elevation of about 2,800 feet above sea level. It will be easily accessible by newly constructed truck trails connecting the Hiawasseo-Helen highway with the Appalachian Scenic highway from Atlanta through Blairsville. Also it will be accessible by way of Helen over Unicoi Gap, where a new highway is being constructed. The only thing wrong with this setup is it will put a hardship on those transporting the boys, as 3 blankets are hardly enough, even in the summer time. South Georgia boys won't believe this, but wait until they arrive and they will want to sleep under mattresses.

THIRD DISTRICT**C. N. Elliott, District Forester
Augusta****New Officers—Woodville TPO**

At a meeting held in Woodville on Monday night, August 13, new officers were elected for the organization. M. M. Shaw, former vice president, was elected president. Mr. Cab Durham was elected vice president and R. I. Calloway, secretary and treasurer. Mr. C. J. Davison, the first president of the organization, died recently. Only a few members were present at the meeting, and they voted to hold a barbecue on August 28, and ask all members of the TPO to attend, at which time plans for the work will be discussed. Attending the meeting were Mr. and Mrs. H. M. Sebring, from Atlanta, and Mr. C. B. Ellington, Camp Superintendent from SP-5, in Crawfordville.

Sequoia Sempervirens

On the old Stetson plantation, near Augusta, where the famous makers of hats were raised, stands a large Redwood tree. It was planted approximately seventy-five years ago, and now stands eighty or more feet in height and is almost two and a half feet in diameter. The tree seems to be healthy and it shows every indication of attaining an age as great as its associates of the Pacific coast. It produces a large number of seed in a good year.

Lone Plant

At the old Berekmun nursery, in Augusta, is a plant which is said to be the only one of its kind in North America, but which has two brethren in the Royal Botanical gardens in Kew, England. It is the *Elliottia Racemosa*. Check list of the trees of the United States says that this tree is found along the eastern border of Georgia, in several counties. Mr. P. J. A. Berkmans, however, says that this plant was discovered in one place in Lincoln county fifty years ago by his father. Plants were brought to Fruitlands Nursery and some were sent to the Royal Botanical Gardens of England. Only three of them survive today. The plant has never been rediscovered.

Side Camp

The side camp from SP-5, at Crawfordville, to Milledgeville, is almost complete. Two buildings from the abandoned camp P-57, at Sylvania, were used in erecting the camp at Milledgeville, in which forty men will be stationed. Work on the property of the state hospital land and the state farm has been planned.

FOURTH DISTRICT**W. G. Wallace, District Forester
Columbus****CCC Progress on Taylor-Talbot
T. P. O.**

The Butler C. C. C. camp has constructed a system of firebreaks that will go a long way towards protecting 150,000 acres of timberland listed in the Taylor-Talbot T. P. O. This camp has found it necessary to construct all of its firebreaks under conditions that required clearing and grubbing of right-of-ways before plowing or grading. This has taken much labor. This camp cannot boast of a large number of miles of finished firebreaks, but it can boast of every mile of its firebreaks being well constructed and located so as to give the greatest possible protection. The system planned, however, will take about six months to complete.

It is easy to see why the new boys are doing such good work in the woods. They did an enormous amount of hard work around their camp during the conditioning period. Their camp is very neat and attractive and well worth seeing. They also constructed the bunkhouse and their swimming pool.

The camp, constructed from excellent wooden fire towers with cabins but unfortunately the lumber structure of the tower starting fire which partially destroyed the structure. The tower is being reconstructed, and precaution will be taken in the form of a lightning protector system, to prevent any recurrence of the misfortune.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Good Supply of Pine Seed

Indications point to an extra large crop of longleaf pine seed in the Savannah district, also a moderate crop of slash and loblolly. The longleaf cones are found on trees in stands ranging in age from 15 to 70 years old, and are practically developed now.

Plans are being made in this district to use one foreman and CCC labor from each of the five camps, to collect cones from longleaf, slash and loblolly pine. The cones will be stored in a central part of the district in a large building until the seed are extracted. A tobacco warehouse is ideal for work of this kind and efforts are being made to secure one for use in the storage of cones and extraction of the seed.

E. C. W. Notes

All of the camps in this district have been brought up to full strength, and a large number of men are getting into the woods each week. We have an average of about one hundred seventy to one hundred seventy-five men per camp in the woods each week. This is greatly aiding the progress of the work, which is moving forward at a nice pace.

We have just been advised that we will get a 99 foot tower for the Tar City T. P. O. in Tattnall county. We now have a crew working at P-82, Reidsville, getting out cypress telephone poles that have been donated by the landowners. The Tar City T. P. O. is to purchase another tower, which will give a two-tower system in Tattnall county.

W. W. May, Jr., foreman at P-61, Soperton, has been transferred to Camp P-63, McRae, to help out with the map work. Mr. May has been a foreman at the Soperton camp since the ECW work started.

Mr. J. W. Cone, foreman at P-53, Hinesville, has been transferred to Camp P-61, Soperton. He will be on duty at the Swainsboro side camp, which is part of the Soperton camp.

SEVENTH DISTRICT

**C. Bernard Beale, Dist. Forester
Waycross**

Lookout Tower Construction

The first of July marked the completion of the first of six wooden 100 foot lookout towers to be constructed in this district. The tower, constructed in Appling county, is of heart cypress, built according to plans designed by the Timber Engineering Co., of Washington, and is of the patented split-ring type of construction. Foreman M. J. Maynard, formerly of P-79, Cornelia,

was in charge of the construction, which was carried on from P-62, Baxley. The second wooden tower to be made from materials furnished by the Appling county T. P. O. is now under way south of Baxley. Foreman W. W. Garwood is in charge.

The erection of a similar tower at Winokur, in Charlton county, will begin at an early date, with Foreman Wilmer Jones in charge, working from P-70, Nahunta, in Brantley county. The Charlton county TPO has already purchased materials for two wooden towers, and plans to erect a third.

Camp Transferred

P-71, St. George, abandoned in July, was moved to Douglas in Coffee county, to re-establish P-68 which was abandoned last November. A new camp, P-84, will be established at Folkston, in Charlton county in October, first to finish working the Charlton county area. The new camp will be located at the 4-H Club camp site about two miles from Folkston, which is an ideal spot due to its excellent drainage and generous stand of majestic live oaks.

Side Camps Planned

Plans have been completed for establishing a side camp at Manor, from P-52, Homerville, and a side camp at Waynesville from P-70 Nahunta. These camps will be up to base camp standards as far as comfort of the men is concerned. They will permit more economical working of large areas in those sections, and provide greater fire protection this winter by having men closer to the area.

Telephone System Extension

The Consolidated TPO, Homerville, has purchased about twenty miles of telephone wire and the necessary insulators and brackets, for the construction of additional telephone lines to complete the system constructed from ECW funds. This will give this TPO almost 100 miles of telephone line.

U. S. FORESTERS WELCOMED

On July 28 the staff of the Georgia Forest Service gave a barbecue to the U. S. Forestry force that established southern headquarters in Atlanta July first. The barbecue was given at Warm Springs where the Georgia home of President Roosevelt is located.

The affair proved highly enjoyable and federal foresters expressed their appreciation of this manifestation of a welcome by state forestry agencies.

George D. Pratt, New York, for several years president of the American Forestry Association, has resigned because of ill health, and Dr. Henry Solon Graves, dean of the Yale Forestry School, has been selected to serve the remainder of Mr. Pratt's term.

SOSEBEE COVE YELLOW POPLAR GROWTH RECORD

What has been designated as the finest stand of second growth yellow poplar in this country is in Sosebee Cove on the north side of Duncan Ridge of the Blue Ridge mountains in Union county, Georgia. The cove is between 3,000 and 3,400 feet elevation.

The Appalachian Forest Experiment Station recently issued a statement on this yellow poplar stand, saying that it is under government ownership, that there has been no past cutting of the stand, and that very few fire scars appear, evidencing that the trees have been kept comparatively free from fire. The report deals with five acres occupied almost entirely by yellow poplar.

The age of the stand is stated to be 53 to 65 years old. The number of yellow poplars 12 inches and larger at 4½ feet from the ground is 90 and contain 23,295 board feet of lumber.

Only 21 other trees are found on the area, these being one black cherry, five black locusts, ten chestnuts, three basswoods, one white ash and one hickory. The total board feet of yellow poplar and other species is 28,559.

The average growth of all trees on the area is 492 board feet per acre annually. The growth for the past ten years shows only 392 board feet annually, the lower rate being due, it is stated, to heavy stocking.

OAK FOR BEER BARRELS

Inquiries indicate considerable interest in Georgia in selling oaks for making beer barrels. White oak (*Quercus alba*) is the species in demand for this purpose. While tests show that other oaks can be used with proper treatment, none other than white oak has yet become of commercial importance in making beer barrels.

In general it may be stated that the beer trade prefers white oaks grown on uplands. Only the best white oak logs, at least 20 inches in diameter are selected for staves. Staves must have no defects and must contain no sapwood.

The wood required for barrel heads must be of a quality equal to that for staves. Quarter sawed material is used.

Anyone desiring further information should write the Forest Products Laboratory, Madison, Wisconsin, and ask for a copy of a leaflet entitled "Brief Description of the Manufacture of Beer and Whiskey Barrels."

Valet (to Master)—"Sir, your car is at the door".

Master—"Yes, I hear it knocking".

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE MACON INDIAN MOUNDS

by
DR. C. C. HARROLD

NOTE: The Indian mounds and remains of Georgia have been a source of mystery and interest since the white man first invaded the realms of the Creeks and the Cherokees. Many people in recent times have dug into these remains searching for relics and have consequently destroyed or carried away unlabeled much evidence of an ancient race. Lately, however, competent archaeologists have become interested in the remains with the double purpose of carefully and scientifically exploring them so that all that is found may be carefully

Georgia, under the direction of the Smithsonian Institution. Careful excavation such as could probably never have been accomplished or financed by local interests was begun in December, 1933. At times approximately 600 persons were employed in the excavation work and the building of roads to the mounds. Two sites, the Ocmulgee fields in East Macon and the Lamar group four miles south of Macon, were excavated. Many other mounds scattered all over the state were visited and observed, all available data being recorded. No other excavation work was attempted, however, in the above mentioned project.

Before this recent work, two other excavations have been scientifically made on

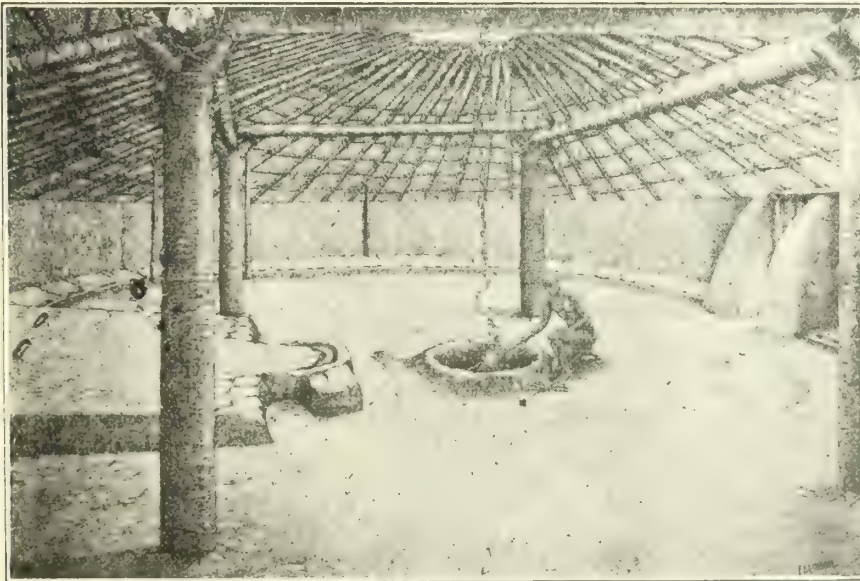
The Etowah mounds and village site at Cartersville, Georgia, were investigated during three seasons of 1925, 1926, and 1927 by the Department of Archaeology of the Phillips Academy, Andover, Massachusetts, and excavations were made. The report of this work and the interpretations of the material found was presented in a valuable report by Dr. Warren K. Moorehead entitled "Exploration of the Etowah Site in Georgia." This report was published in 1932 for the Phillips Academy by the Yale University Press.

The work at Macon has been followed with active interest by Dr. C. C. Harrold, the president of The Society for Georgia Archaeology. The State Geologist has requested Dr. Harrold to prepare the following report on the Old Ocmulgee Fields. — *R. W. Smith, State Geologist.*

A bill creating a National Ocmulgee Monument passed both houses of congress at its recent session and has been signed by the President. This act provides that approximately two thousand acres of land must be purchased by interested citizens of Georgia and presented to the U. S. Government. These lands must lie close to Macon and must embrace the sites of ancient Indian villages and mounds. Since work was started under the Smithsonian Institution with CWA funds in December, 1933, thousands of Georgians and visitors from other states have visited the site of the proposed park. Engineers and the head of the historic section of the National Park Service have visited and inspected the property as well as the heads of the Bureau of Ethnology of The Smithsonian Institution.

A great deal of interest has been aroused by a group of house rings in the river bank twenty miles below Macon as well as in the large mounds which lie almost within the city limits. Very probably the single feature attracting the most attention is the Council House which is located on the Dunlap lands in East Macon. This house was found almost by accident as its location is not on the highest point of the hill which rises in the large plateau originally the prehistoric village site. On Christmas day, 1933, Dr. A. R. Kelly, whom the Smithsonian Institution had sent down to take charge of the work, noticed a very small insignificant rise a hundred and fifty feet to the southeast of the hill which has turned out to be a small house mound itself. This small rise was so insignificant that the writer thought it was nothing more than the site of an old burned negro cabin. Excavations a few weeks later revealed remnants of the round council house illustrated in this issue with a drawing by the artist, Francis Etheridge, who has made many splendid sketches of the remains.

The council house is 42 feet in diameter. The floor was only about three feet under the ground but the heavy clay roof of the house had so completely covered the floor



ANCIENT PROTOMUSKHOGEAN COUNCIL HOUSE OLD OCMULGEE FIELDS, MACON, GEORGIA

Artist's Reproduction by Francis Etheridge

Artists Conception Interior View—Floor Today as it was 800 to 1200 Years Ago—Fallen Roof Timbers and Clay Roof Materials Found on Floor—Holes for Main Upright Supports for Roof in Evidence—Narrow Entrance, Partially Underground with Heavy Clay Pillars Still Shows—Main Floor about Two and a Half Feet Beneath General Level of Ground

interpreted, and for preserving the remains for Georgians and visitors to Georgia.

In October of 1933, a group of people interested in Indian lore banded together as The Society for Georgia Archaeology under the leadership of Dr. C. C. Harrold, of Macon. It was through the efforts of this society that the Government agencies of CWA and FERA were induced to investigate certain mounds in and near Macon,

Georgia mounds. In 1915 a joint expedition of the Museum of the American Indian, Heye Foundation, and the Bureau of American Ethnology of the Smithsonian Institution excavated the Nacoochee mound near Mount Yonah in White county. The report of this valuable exploration was published in 1918 by the Heye Foundation as "The Nacoochee Mound in Georgia by George G. Heye, F. W. Hodge, and George H. Pepper.

that it was perfectly preserved. The timbers which had supported the clay roof show as radiating charcoal logs. A few of the large cross timbers and the remains of the four upright logs also are still present on the floor. A temporary roof has been placed over the structure to preserve it until such time as the National Park Service can build a suitable permanent roof.

The council house is unique in many features. In some ways it is similar to the round council houses on the St. Mary's river, described in 1580 and in 1690. In other respects it more closely resembles the proto-kivas in the Southwest described in 1929. Unique features consist of fifty clay seats arranged around the outer rim of the circular floor, the clay eagle on the floor, and the three seats on the back of the eagle. In front of each of the fifty seats is a small hollow in the clay which is oval in outline and about four or six inches deep. Each of these small pits would hold about three quarts of water. There are many different suggestions as to what these holes were used for. The suggestion of the school children is almost invariably that they were intended to place the heels in to help the man in council to sit more comfortably. The suggestion of Dr. John R. Swanton is that they were intended to hold the private valuables or tobacco of the man in council.

The narrow partially underground entrance is similar to the entrance to the proto-kiva found in the southwest, and so is the sunken central fireplace. The eagle is similar to the eagle found in copper at Llewah and to the eagle found in Mexico in Maya excavations and also to the eagle found at Moundville, Alabama in shell. The peculiar angular symbol under the eye is present in all of the above although its significance is not known. The three raised seats on the back of the eagle must certainly have been occupied by the chief and his assistants. To each side of the eagle the seats are wider and higher than their neighboring ones, decreasing in width until the door is reached where they again become wider.

Pottery found in this council house and close to it in the cultivated corn field is extremely crude. Experts will give no approximate date for the building of the structure. All agree that the site was abandoned long before 1540 when DeSoto crossed the Ocmulgee somewhere to the south of Macon, and visiting archaeologists from Washington and other states believe that the council house itself is several hundred years older than the house sites which lie several feet under the ground close by, and which were themselves deserted before 1540. Very close to the council house is another house site, a square one which was also under the ground about three feet. Then there is a buried corn field with

and on this low mound are found two other house sites, one just under the level of the historic cultivated field and another house site four feet lower.

The object of the Society for Georgia Archaeology is to study such sites of the above, to secure possession of them if possible and to keep all artifacts found in Georgia when possible. For the past eight months work has been going on under grants from CWA and FERA funds. From the very beginning the Smithsonian Institution has given perfect cooperation and advice. The Smithsonian has had permission from local authorities and groups interested in the work to take various artifacts to the museum in Washington. Very few artifacts have been removed and certain of those will be returned at such time as a museum is available for housing them in Georgia. It is hoped that further work will be done in other parts of the state whenever the National Park Service takes over the Old Ocmulgee Fields in Macon and makes them into the proposed National Ocmulgee Monument.

KYANITE FOUND TO BE ABUNDANT IN N. GEORGIA

Government geologists have located within the past month large deposits of kyanite in Habersham and Rabun counties according to Mr. L. M. Prindle, in charge of the investigation now being conducted by the United States Geological Survey with the cooperation of the Georgia Division of Geology. Scattered occurrences of a kyanite-mica schist previously known in Habersham county proved to be part of a large U-shaped belt starting near Clarksville and extending more than ten miles northeastward into Rabun county. This belt varies in width from 100 to about 1,000 feet and is quite uniform in character throughout its length. The two arms of the belt are two or three miles apart. The northeastward limits of the belt have not yet been found and it may prove to extend across Rabun county into North Carolina.

Mr. Prindle and his assistant, Mr. Charles Greene, of Atlanta, will work from Rabun county westward into Towns, Union, Fannin, Gilmer, Pickens, and Cherokee counties searching for deposits of vermiculite and olivine as well as kyanite. Later, they will visit scattered kyanite deposits in the Piedmont Plateau in middle Georgia.

Kyanite and olivine are minerals now used in the manufacture of heavy duty fire brick and high temperature refractories, while vermiculite is used in heat and sound insulating brick and boards. The bronze color of the vermiculite is sometimes utilized in the manufacture of inks and paints.

GOLD INVESTIGATION COMPLETED

The investigation of the gold deposits of Georgia by Dr. Roy A. Wilson of the United States Geological Survey, through funds furnished by the Public Works Authority, were completed the first of September. Through arrangements just completed by the State Geologist, the first published results of this investigation will appear in the Forestry-Geological Review as a series of five articles by Dr. Wilson starting in the October issue. The first three articles will cover the occurrence, character, and origin of the gold deposits and their future possibilities. The other two articles will describe the present activity in the various gold districts. These authoritative articles should help guide future developments of gold in Georgia. A series of scientific papers on the technical aspects and a comprehensive report will appear in bulletin form later.

Wood Preservative Treatment— 1933

According to the U. S. Forest Service, 22,696,565 crossties, 192,936,660 board feet of miscellaneous timber, 65,163,331 board feet of switch ties, 1,711,411 poles and 9,173,871 lineal feet of piling were creosoted in 1933.

Of the crossties 35.5 per cent were oak, 19.8 per cent southern pine, 11.4 Douglas fir, other woods 33.3 per cent. Of the poles, 1,067,854 of the 1,711,411 were southern pine.

Dr. Crickmay, Geologist, Returns To Georgia October First

Dr. G. W. Crickmay, assistant state geologist of Georgia, who has been on leave of absence to the U. S. Geological Survey for making a detailed geological survey at Warm Springs, Georgia, is nearing the completion of the assignment, and will resume his duties as assistant state geologist on October first.

PINE GROWING INDUSTRY GIVES ENCOURAGING RESULTS

(Continued from Page 1)

young pine trees profitably with even a partially open mind, it is easily possible to show him our tract and others in this section, and he must see the difference between the young growth on our land compared to the lack of young growth on lands where no such fire protection methods and reforestation have been practiced.

"Unless there is a concerted move on the part of land owners in this territory to develop the growth of young timber, the two industries that have meant so much in the development of our part of the state—naval stores and lumber—will become a thing of the past."

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DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

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ATLANTA, GA., OCTOBER, 1934

No. 10

FORESTRY ASSOCIATION AGAINST FEDERAL ACQUISITION IN STATE

Favors Forestry Remaining in U. S. Department of Agriculture — Wants More CCC Camps on Pri- vate Lands in Georgia.

At a meeting of the executive committee of the Georgia Forestry Association in Atlanta September 14, attended by prominent citizens from various parts of the state, a resolution was passed opposing a proposed transfer of the federal bureau of forestry from the U. S. Department of Agriculture to the U. S. Department of Interior, on the grounds that most of the best lands in this country are owned by farmers whom the Department of Agriculture is in better position to serve.

The association's opposition to federal acquisition of commercial forest lands in Georgia for commercial development was defined in a resolution that gave as reasons for its position the removal of large areas of land from taxation, competition of federal government with private land owners, and the fact that Georgia has an efficient forest service with a well defined program of education, demonstration and protection, which is working harmoniously with federal authorities.

The Committee petitioned federal authorities by resolution to maintain a large number of CCC camps in Georgia, saying that this state has the largest timber acreage of any state in the union, and that CCC work with timber protective organizations on private lands is proving highly educational in promoting forestry. The resolution deplored the tendency to move the camps from private to public owned forest lands.

Those attending the meeting were: T. G. Wolford, Atlanta; Mrs. M. E. Judd, Dalton; J. M. Mallory and George Butler, Savannah; James Fowler and James Gillis, Merton; Jack Williams, Waycross; Miss Emily Woodward, Vienna; Judge G. Ogden Persons, Forsyth; Dr. W. G. Lee, Macon; J. S. Charles Center, College Park; Joseph C. Cord, B. M. Lufburrow, Edgar Center, and Turner, W. H. Barnwell and C. A. Little, Atlanta.

Copy of the resolution opposing transfer of federal bureau of forestry, is as follows:

"WHEREAS, an agitation is now in progress over a proposal to remove the federal Bureau of Forestry from the U. S. Department of Agriculture to the Department of Interior; and

"WHEREAS, federal forestry work has made favorable progress for many years as a branch of the Department of Agriculture, in which body it is apparently happily and efficiently coordinated; and

"WHEREAS, the development of forest resources now concerns the farmer more than any other class of citizen, and since the modern conception of forestry is to grow trees as a crop with all that means of crop management, it seems that to make the proposed change would stress utilization of forest resources at the expense of tree production. As long as the greater part of timberlands are held by farmers and are not federal land domain, it logically follows that the U. S. Department of Agriculture with its established avenues of contact with farmers is the logical agency to handle forestry. Therefore,

"BE IT RESOLVED: That the Executive Committee of the Georgia Forestry Association expresses its preference for the present association of forestry with the U. S. Department of Agriculture rather than for its proposed incorporation into the U. S. Department of Interior."

Copy of the resolution on federal acquisition of forest lands in Georgia is as follows:

"WHEREAS, the forestry policies of the State of Georgia have been advocated by the Georgia Forestry Association, an organization formed in 1922, with a membership composed of foresters and citizens from all walks of life interested in promoting commercial forestry, who are thoroughly posted as to the needs for developing forestry in the state; and

"WHEREAS, the State of Georgia has an efficient forest service with a well defined forestry program of education, demonstration and protection, and is working harmoniously with federal authorities; and

"WHEREAS, the Georgia Forestry Association has recommended and approved the Enabling Act of the General Assembly of the State of Georgia whereby the federal government has acquired areas in the mountains of north Georgia for watershed control purposes, and is privileged to purchase the Okefenokee Swamp area; therefore,

"BE IT RESOLVED: By the Executive Committee of the Georgia Forestry Association, in session September 14, 1934, that it record its opposition to federal and state ownership of commercial forestry lands for commercial development, thereby withdrawing such lands from taxation and creating federal competition with private ownership; and approves federal or state purchase of only a limited acreage of land for research and demonstration purposes."

VOCATIONAL FORESTERS USED AS RELIEF TEACHERS

Assistants to Vocational Agricultural Teachers in Conducting Community Classes in Forestry Practices.

Among those employed in Georgia as Relief Teachers with funds made available from federal sources, are young men who during the past four years have received certificates of Vocational Forester at the vocational forestry camps. They are acting as assistants to the vocational agricultural teachers in the rural high schools of the state and will be used largely in carrying on a program of community instruction in forestry practices.

Among the activities will be adult classes, where the vocational foresters will discuss the importance of forest fire protection and methods to be pursued. They will discuss and demonstrate thinning; consider local problems and methods of harvesting and marketing; teach timber owners how to estimate the volume of standing timber, the uses of various woods, the identification of various tree species, the gathering and marketing of tree seed, operation of tree seed beds for growing planting stock, tree planting, methods of turpentineing in south Georgia, and how to obtain miscellaneous forest incomes.

A list of the vocational foresters already employed, that will probably be added to later is as follows:

Ashley Whitehurst, Adel, Ga.; Delmas Galbreath, Vidalia; Edmond P. Dillard, Richland; Thomas Strickland, Dalton; Joseph L. Spence, Waresboro; Herman D. Tyson, Sycamore; I. J. Medders, Sylvester; Bill Crosby, Camilla; Shad Calloway, Hogsansville; Robt. Radford, Adrian; Truett Drake, Adrian; Eugene Adams, Norman Park; Merrill Boyd, Fairburn; Charlie Jones, Coffee, Ga.

Naval Stores Committee Change

W. O. Wingate, Ocilla, a member of the Naval Stores Control Committee of Georgia, having died, the Georgia producers were called upon to ballot to elect his successor. C. L. McCarthy, White Oak, Camden county, prominent in the industry, was chosen.

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GEORGIA FOREST LAND CLASSIFICATION

Federal and state agencies have been engaged in a forest land classification of Georgia. The chief objectives are to find out how many people are depending upon the forests for a livelihood, how many more could be employed if forests were so managed as to produce a maximum yield of timber per acre; how much land could be used to grow trees that is now idle or too poor to grow agricultural crops profitably; what species of trees should be encouraged, the number of wood using industries, their capacity, number of employees or dependencies. In general, the effort is to ascertain definite facts that will serve as a guide to planning the future development of timber resources in the state.

PRIVATE FORESTRY SUCCESS FOR CENTURIES IN EUROPE

Dr. Franz Heske, of Germany, in an address in this country, said among other things that private forestry in Germany and other European countries has been for more than a century a profitable self-sustaining industry, operating without government grant. Through generations of experience, he said, funds invested and reinvested in the forests are far more secure than those put into industries more subject to economic fluctuation.

The rule followed by private forestry, Dr. Heske said, is that reforestation be an integral part of harvesting and that only the increment of growth since a previous cutting shall be harvested at any one time.

GATHERING TREE SEED TIME NOW TO ACT

Last year seed were very scarce. This year they are comparatively abundant. The demand for tree seed is greater than ever before, thanks to the tremendous planting program launched by the federal and state forest agencies.

The greatest demand for tree planting stock ever created in the history of the world is involved in the plan to plant a shelter belt 100 miles wide and 1,000 miles long in the west. A large number of tree nurseries are being established to provide for this demand.

What species of trees will be used on shelter belt planting has not been made known at the time this is written, but the probabilities are that not many species indigenous to the south will be used.

For the south, the greatest demand for tree seed this year will be for carrying out southern planting programs. This calls for a large amount of pine seed, for the pine is by long odds the kind of tree most desired for planting purposes in the south. Second to the pine is the black locust.

The seed from three species of pine — slash, loblolly and longleaf — will be required by tree nurseries. Slash and longleaf are needed for plantings in the lower south because of their adaptability to naval stores production. In the upper south, loblolly pine is recommended for planting because it grows more rapidly than other pines native to the section.

Black locust is native to the upper south, but will grow in the lower south. It is in demand because it will grow rapidly on poor land since it is a legume and able to get nitrogen from the air.

Season to Gather Seed

Now is the time to gather seed. It would be better not to postpone it longer than October 15, for shortly after that time pine burs will be opening and releasing their seed. Pine seed harvesting time is between September 15 and October 15.

It is not necessary to wait until the burs are thoroughly brown to gather them. They may have a tinge of green and be ripe enough to harvest.

Wherever trees are being cut by sawmill men from September 15 to October 15, is the place to gather seed with the least trouble. Bushels of burs can be gathered from the fallen tree tops in a very short time.

Where one does not have logging operations, the best way is to equip a long stick with a blade of some kind with which to sever the bur from the twig.

After the burs have been gathered, they should be spread out in a dry place to dry out. When thoroughly dry, they will have opened up their scales, and no trouble is experienced in beating out the seed.

Each seed has a wing attached. These should be rubbed off and the wings winnowed out. It will be almost impossible to

take off all the winged part of longleaf seed, but as much should be rubbed off as practical.

After the seed are cleaned they may be placed in tight containers and kept until planting time. If they are to be sold, they may be offered at once to tree nurseries or to seed buyers.

In Georgia, state tree nurseries are operated by the Georgia Forest Service and are located at Albany and Blairsville. The School of Forestry at the State College of Agriculture, Athens, also operates a large tree nursery. This year the seed for the state nurseries will be gathered by CCC men.

What the prices for seed will be this year have not been announced. They have varied widely in the past, depending upon the available supply and quality of the seed, running from \$1.00 to \$2.00 per pound. A bushel of cones will produce about one pound of seed.

If seed are winnowed well, so that not only trash but light and undeveloped seed are removed, the seed grade high and bring a better price.

Of course the seed must be pure. No mixture of species will be accepted. Unless one knows slash, longleaf and loblolly pines, they should not undertake to gather seed.

CCC CAMP CHANGES TPO WORK REDUCED

Only 14 Camps Under State Supervision now on Organized Private Land and 5 Camps on State Parks.

The number of CCC camps on private land of Timber Protective Organizations of Georgia, beginning October 1 or 15, is down to 14. The number of camps of this kind reached twice this number in early stages of CCC work. Five camps are scheduled to remain on state parks. Efforts are being made at the time this is written, which may result in a change of these figures.

Not all the reduction in Georgia's private land quota of camps was made October first. In the first period there were 29 camps; in the second period 26; third period, 17; fourth period, 14. The number of park camps has increased as follows: First period 1; second period 2; third period 6; fourth period 5.

A list of camps on privately owned, or TPO lands, as of October 1 or 15, is as follows:

Homerville, Hinesville, Fargo, Woodbine, Soperton, Baxley, McRae, Jesup, Bainbridge, Douglas, Nahunta, Bloomingdale, Reidsville, Folkston.

The list of state park camps, as of October 1, is as follows: Vogel Park, Blairsville; San Domingo Mission Park, Brunswick; Alexander Stephens Memorial Park, Crawfordville; Fort Mountain Park, Ellijay; Pine Mountain Park, Warm Springs.

FORESTRY IN RELATION TO EROSION PREVENTION

Back to Trees only Hope for Redeeming Vast Acreage in South to Agricultural Usage — Best of Soil Binding Vegetation.

A great drive is on under the able leadership of H. H. Bennett, of the U. S. Department of Agriculture, to stem the tide of tremendous losses of soil fertility through land erosion. Never has the country been more thoroughly aroused over any agricultural program than erosion prevention. As attention is drawn to the millions of gullied acres and the continued gashing and bleeding away of the lands' life giving properties. A strong movement is on foot to do something about it. Many community and county-wide cooperative terracing projects are active. The first consideration, naturally, is to save the lands that are still capable of growing crops or pasturage profitably.

But what is being done about the abandoned and gullied farms or portions of farms? Unless something is done to curb washing on such lands, a great deal of the most serious erosion losses will continue. It is not so much the damage that erosion is doing to these abandoned lands, as it is the damage the materials carried from them is doing to the better lands down stream. Gravel and sand pouring from the gullies fill up the stream beds, causing destructive overflows. This gravel and sand, impelled by flood waters, scour away the fertile soils of lowlands, leaving swamps or infertile sand deposits. Therefore, erosion control, limited to holding soil in place on cultivated lands, is not adequate; there must be protection of lowlands from devastation coming down from the gullies of abandoned lands.

Wherever else it may be wise to allow trees to retake the land, there can be no question that gullied lands should be reforested. Only the deep and broad roots of trees and the accumulation of their droppings of leaves and twigs will salvage such lands. Only trees are likely to develop any income worth while in the process of recovery. Of course trees will not make rapid growth on lands of such low fertility, but the longer they grow the more rapid the growth, for the trees' improvement of the physical condition of the land renders the locked up plant food of the raw soil more available.

What to plant on depleted soils of the south is a question to be answered in facing the problem.

Two species of trees are generally recommended for southern soils of low fertility, pines and black locust. In the northern half of Georgia the loblolly pine is recommended because of its rapid growing habits, but shortleaf is desirable where loblolly cannot be obtained. In south Georgia

slash and longleaf are preferred. Slash, being more rapid growing than longleaf, may be given the preference.

Black locust is very desirable, since it is a legume and capable of improving the land more than the pines, and since it will grow successfully on poor lands.

From a consideration of returns, whether pines or black locust should be grown, the answer depends on the needs of the farm and upon the opportunities for marketing. Pine is more useful than black locust for fuel, poles, lumber, pulpwood, crossties, and certain species of pines are suited to producing naval stores. Black locust finds its largest use as fence posts for which no wood is better. It also finds a market as crossarms and wooden pegs in electric transmission, and for minor uses.

On raw soils it is advisable to put some fertile soil in the planting hole to give the trees a good start. In gullies, checkdams made of rock, tree branches or other material to hold the wash, should be placed below the planted tree.

The sooner the gullied lands are put to growing trees the better. The owner of gullied land should get ready to do some tree planting next spring.

USES OF NAVAL STORES

According to statistics compiled by the Bureau of Chemistry and Soils, turpentine and rosin were used in the United States in the following amounts and for the following purposes, in 1933:

Automobiles and wagons, 42,628 gallons turpentine, 1,505 barrels rosin.

Chemicals and pharmaceuticals, 37,394 gallons turpentine, 3,889 barrels rosin.

Foundries and foundry supplies, 10,284 gallons turpentine, 1,670 barrels rosin;

Linoleum, 110 gallons turpentine, 19,500 barrels rosin;

Matches, 3,160 barrels rosin;

Miscellaneous, 41,511 gallons turpentine, 3,045 barrels rosin.

Oils and greases, 10,067 gallons turpentine, 30,634 barrels rosin.

Paper and paper size, 1,446 gallons turpentine, 320,940 barrels rosin.

Paint and varnish, 2,568,241 gallons turpentine, 168,640 barrels rosin.

Printing ink, 19,465 gallons turpentine, 11,677 barrels rosin.

Sealing wax, pitch, insulating and plastics, 31,266 gallons turpentine, 11,519 barrels rosin.

Shipyards, carshops, etc., 25,556 gallons turpentine, 39 barrels rosin.

Shoe Polish, 575,793 gallons turpentine, 850 barrels rosin.

Soap, 5,634 gallons turpentine, 264,173 barrels rosin.

The total consumption of turpentine in 1933 is estimated at 3,369,405 gallons of turpentine and 841,271 barrels (500 lbs. each) of rosin.

NAVAL STORES DATA FROM U. S. FOREST SURVEY

Prospect of Sustained Yields in 35 Georgia Counties Promising — Chipping Trees Under Minimum Diameter in Evidence.

Thirty-five counties in southeast Georgia were among the first to be covered by the U. S. Forest Service in the forest survey now in progress. Some of the data has been released by Captain I. F. Eldredge, regional survey director, with headquarters at the Southern Forest Experiment Station at New Orleans. Other data is in process of compilation and all data will soon be available.

Important data concerns the present and prospective slash and longleaf pines available for naval stores production, and the first report on the Georgia area mentioned deals with this information, since there seemed to be an immediate need for it.

The preliminary report does not reveal the number of crops, but deals with percentages of trees of varying diameters, round and chipped. Practically half (49 per cent) of round slash and longleaf pines is under 5 inches in diameter (D.B.H.); 30 per cent is 3 to 4.9 inches; 15 per cent 7 to 8.9 inches; 4 per cent 7 to 8.9 inches; 1 per cent 9 to 10.9 inches; 1 per cent 11 to 12.9 inches; 1 per cent 13 inches and larger.

Trees having diameters 9 inches and above are the only ones, according to the best authorities, that can be turpented profitably. Therefore, only 6 per cent of the round slash and longleaf pines in the area should be used. The remainder, or 94 per cent, is to be considered potential. Judged by normal growth rates, 15 per cent will be available in three or four years, 30 per cent in 5 or 6 years, and 49 per cent in 7 to 9 years.

The data collected by the survey show some interesting facts about the size of trees now being worked for turpentine, and reveals that the naval stores industry does not confine itself to chipping a minimum of 9 inch diameter trees. Here is what was found: Trees 3 to 4.9 inch diameter are not chipped; 3 per cent of trees being worked are 5 to 6.9 inches in diameter; 33 per cent of trees being worked are 7 to 8.9 inches in diameter; 29 per cent of trees being worked are 9 to 10.9 inches in diameter; 19 per cent of chipped trees are 11 to 12.9 inches in diameter; 10 per cent of chipped trees are 13 to 14.9 inches in diameter; 6 per cent of chipped trees are 15 inches and larger in diameter.

These figures reveal 36 per cent of the trees now being worked are below 9 inches in diameter and too small to yield a profit.

A consolidation of the data of round and working trees shows 36 per cent of all trees 3 to 4.9 inches in diameter are round; 23 per cent of all trees are 5 to 6.0 inches, of which 2 per cent are chipped, 1 per cent

resting and 1 per cent worked out; 19 per cent of all trees are 7 to 8.9 inches, of which 26 per cent are working, 12 per cent resting and 4 per cent are worked out; 11 per cent of all trees are 9 to 10.9 inches in diameter, of which 42 per cent are working, 18 per cent are resting and 12 per cent worked out; 6 per cent of all trees are 11 to 12.9 inches in diameter, of which 47 per cent are working, 20 per cent are idle, and 17 per cent worked out; 11 per cent are above 11 inches in diameter, of which 45 per cent are working, 17 per cent idle, 19 per cent worked out.

From this data, it will be seen that 22 per cent of all trees are above 9 inches in diameter, and therefore of profitable turpentine size, but only 6 per cent of all trees 9 inches and above in diameter are not now being worked. If the naval stores industry confined itself to chipping only trees 9 inches and larger in diameter, there would be little room for increased production in the territory in question during the next few years.

NEW VOCATIONAL SCHOOLS INTRODUCE FORESTRY WORK

Georgia has 47 new white schools and 6 new colored schools with vocational agricultural teachers who are inaugurating forestry in their courses and have established, or plan to establish, school demonstration forests of ten acres or more. In all there are now 146 vocational white schools and 45 colored schools, a total of 191.

The names of new schools, teachers and the post office addresses of new white schools are as follows:

Ashton Junior High—C. H. McDaniel, Fitzgerald; Alma High, J. H. Hatcher, Alma.

Bluffton High—J. A. Ariail, Fort Gaines; Bridgeboro High—R. E. Fowler, Bridgeboro.

Chattanooga Valley High—J. F. Hawkins, St. Elmo, Tenn.; Cleveland High—J. D. Hulsey, Cleveland; Crawford County High—I. E. Sanders, Roberta; Cusseta High, G. E. Stancil, Cusseta.

Eagle Grove—R. L. O'Kelly, Royston; Elmodel High—C. A. Nix, Elmodel.

Faceville High—R. H. Smalley, Faceville; Fannin County High—W. T. Ezzard, Morganton; Fort Gaines High—J. A. Ariail, Fort Gaines.

Goldmine Consol.—R. L. O'Kelly, Royston; Good Hope Consol.—Garland Bryant, Good Hope; Grayson High—H. L. Ariail, Grayson; Gray High—Ard Pulliam, Gray. Ila High—C. L. Veatch, Ila.

Jersey High—R. D. Stephens, Jersey.

Lafayette High—J. F. Cobb, Lafayette; Lakeland High—J. D. Lewis, Lakeland; Livingston High—H. G. Fleeman, Oxford; Logansville High—R. D. Stephens, Logansville; Lynwood Jr. High—C. H. McDaniel, Fitzgerald.

Mary Persons High—B. P. Thornton, Forsyth; Monroe High—Garland Bryant, Monroe; Montgomery High—C. L. Girtman, Kibbee; Murray County High—G. I. Maddox, Chatsworth.

New Branch High—W. J. Culberson, Lyons.

Oakwood High—J. J. Segars, Oakwood. Pinehurst High—J. M. Thornton, Pinehurst.

Rossville High—J. F. Hawkins, Rossville.

Sandy Mount High—J. M. Thornton, Pinehurst; Sardis High—G. M. Smith, Sardis; Swainsboro High—R. B. Burt, Swainsboro.

Ty Ty High—J. H. Chapman, Ty Ty.

Valley Point High—W. M. Putney, Dalton, Rt. 1.

The names, teachers and addresses of new colored schools are as follows:

Brooks County High—R. A. Bryant, Quitman; T. & A. College—I. S. Glover, Forsyth; Mt. Mariah Jr. High—T. R. Mayo, Climax; Moreland Public School—N. P. Wilson, Newnan; Vienna H. & I.—R. R. Kenon, Vienna; Wilkes County Training School—R. T. Church, Washington.

E. LEE WORSHAM DIES

E. Lee Worsham, a pioneer in promoting forestry in Georgia, died suddenly September 9 at Alma, Ga., as the result of a skidding and overturning automobile. He died instantly.

Mr. Worsham was a native of Monroe county, graduate of the University of Georgia, taught at the University, took special work in Cornell University, and became state entomologist of Georgia. At the time of his death he was attached to the Internal Revenue Department of the federal government.

Surviving Mr. Worsham are a son, Lee, a daughter, Louise, mother of Forsyth, and several brothers and sisters. He numbered his friends by the thousands in Georgia, possessed a delightful personality, and his death is widely deplored.

According to E. L. Demmon, Director of the Southern Forest Experiment Station, New Orleans, the south should plant in the next 20 years, 5,579,000 acres of land to trees. Up to 1932 the total area planted to trees in the southern states was only 73,248 acres.

Cutting out "cuss words" in national forest short wave broadcasting, is the subject of a special order from the U. S. Forest Service. The public finds tuning in on forest radios instructive, but woodsmen's cuss words, not being informative, are to find other channels than the radio.

It has been estimated that two nesting pairs of insect eating birds will consume approximately 6,000,000 saw fly or similar insect larvae a year.

AUTUMN FOLIAGE COLORS BRILLIANT IN MOUNTAINS

Climatic conditions and varied species of trees make the coloring of tree foliage most brilliant in the mountains of north Georgia. It is well worth while to make a long trip to see the glorious array of nature's fall painting on the mountain side and in the highland valley of Georgia.

One of the choicest trips in quest of foliage beauty is to Vogel Park on the crest of the Blue Ridge, reached by the Appalachian Scenic Highway. The park has picnic grounds, or, if one does not find it convenient to carry lunch, food can be obtained in the dining room maintained by the keeper.

The visitor may take one of the numerous trails through the park and up the mountains and obtain views near and far, and while in the park, take note of the development and beautification work now being carried out by a CCC camp.



Cottage erected by CCC labor at the State Tree Nursery, Albany.

Ninety-eight per cent of all forest land in the south is privately owned, which comprises nearly half of all privately owned forest land in the nation.

The hardest hardwoods such as ebony, lignum-vitae and teak grow in the tropics, while very soft woods such as aspen, white pine and fir grow in the far north.

FORESTRY ASSOCIATIONS MEET OCTOBER 16-20 AT KNOXVILLE

The National Association of State Foresters will hold its annual meeting October 16-17 at Knoxville, Tenn. Immediately following, the American Forestry Association will meet at the same place, October 17-20.

Spandid programs are to be presented and very interesting excursions are planned. The meetings of the American Forestry Association are open to the public and a large number of southeastern interested in forestry should attend. The meeting affords an opportunity to hear and meet the nation's leading foresters.

Discussions will deal with measures for furthering national forestry movements now in progress.

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FIRST DISTRICT**Russell Franklin, Dist. Forester
Rome****M. E. Pinson Dies**

Mr. M. E. Pinson, secretary-treasurer and patrolman for the Ellijay Timber Protective Organization died recently at his home in Ellijay. Mr. Pinson had been connected with the Shippen Hardwood Co. for the past twenty years and was a pioneer in forestry in that section. Mr. Pinson had, for many years prior to the organizing of the T. P. O., advocated the protection of the forest lands from fire, and it was through his untiring efforts that the T. P. O. is a success.

Son Succeeds Father

The Ellijay Timber Protective Organization has appointed Mr. Herrman Pinson, son of the deceased, to take up the work left by his father. Mr. Herrman Pinson has also been connected with the Shippen Hardwood Co., and has been appointed by this company to succeed his father as manager of their holdings in northwest Georgia.

THIRD DISTRICT**C. N. Elliott, District Forester
Augusta****Plans Forest Development**

Landon Thomas, of Augusta, recently purchased 600 acres of land on the headwaters of Spirit Creek in Richmond county. Mr. Thomas plans to carry on intensive forestry developments on this property. He has cut fire breaks around the entire area and divided it up into several sections. Clearing and planting operations are included in the management plan. Mr. Thomas plans to plant 15,000 longleaf and 15,000 loblolly pine seedlings this fall and winter. The 600 acres are included in the organization of a TPO which is being organized on the headwaters of Spirit Creek.

Woodville T. P. O.

At a recent meeting of the Woodville T. P. O. in Greene county, the organization planned to extend the telephone system several miles, erect a tower to overlook the area, and to extend the present boundaries of the area to include an additional 30,000 acres. Mr. M. M. Shaw, president of the organization, presided at the meeting.

District Boundary Changed

Boundaries of the Augusta district were recently changed. The counties of Stephens, Hart, Elbert, Franklin and Madison were taken out from under the supervision of the Augusta office and placed in the Milledgeville division of the department, and Dalton, Newton, Rockdale, and Butts counties added.

Milledgeville Side Camp

The side camp at Milledgeville has been completed and 40 CCC boys from the park camp at Crawfordville went to work on the property of the state hospital on September 18. From six to ten months will be required to complete the work planned.

FOURTH DISTRICT**W. G. Wallace, District Forester
Columbus****Butler C. C. C. Camp Moves**

The Butler C. C. C. Camp located in Taylor county and working on land listed in the Taylor-Talbot T. P. O. is scheduled to move to a new project October 1, after having been located near Butler since June 1933. This camp has done excellent work, having built a system of firebreaks and lookout towers capable of giving a good protection system to this T. P. O. if the T. P. O. officers and members will make proper use of and maintain this system.

We are very sorry to see this camp go. The business like and efficient manner in which Supt. Barrett has conducted the work project, and the loyal and efficient support of the foremen and C. C. C. enrollees is a credit to the entire personnel of the camp. This camp has a very neat appearance, and located on a paved highway. This neat and orderly appearance is a credit to the army officers in charge. This camp has been characterized by hard work including every man connected with it. The Georgia Forest Service appreciates the loyalty of every person connected with this camp and we take this opportunity to wish each and every one of these men a successful future.

Vocational Forestry News

At the writing of this article schools are nearly all open and busy getting set for a good years work. A good start goes a long way towards a successful end. The district forester is now making plans to visit each vocational agriculture school in this district at the earliest possible date. I am anxious to see every school do some outstanding forestry work this year and I stand ready to give every possible assistance I can to both teachers and students in accomplishing this objective.

Collecting Pine Seed

The Warm Springs C. C. C. camp is scheduled to collect 100 bushels of loblolly pine cones beginning shortly after October 1st. We have found the C. C. C. boys take great interest in planting forest seedlings, and we predict they are going to take to gathering pine like a duck takes to water.

Vocational agriculture teachers will miss an excellent opportunity to instill a deeper interest in forestry in their students if they do not gather some pine cones and extract the seed this fall. A good crop of cones is reported over the state, but the season for gathering them only lasts for two or three

weeks. Cones in the Columbus district will probably be ready for gathering the first to the middle of October. Remember, the cones don't wait on you.

SP-7 News

A visit to the State park project on Pine Mountain will disclose a scene of much activity. Log cabins, lakes, and a Park Inn have been approved by the Department of the Interior, and some construction is now under way. A site for a large lake has been cleared. Gasoline shovels, tractors, and other heavy machinery will be seen at work as well as the muscles of the darkly sun-tanned backs of nearly 200 boys.

The Pine Mountain park will be a show place of Georgia in a few more months. The public is invited to come and see what is happening.

SIXTH DISTRICT**Jack Thurmond, Dist. Forester
Savannah****T. P. O. Meeting**

On September 7th the Tar City T. P. O. covering timber lands in Tattnall county, held a meeting and instructed the secretary-treasurer to purchase a 102-foot inside ladder steel lookout tower to supplement the one steel tower bought for this T. P. O. from ECW funds.

The Tar City T. P. O. has approximately 80,000 acres listed and two towers will give adequate detection for forest fires on this area. The T. P. O. members have donated enough heart cypress telephone poles to construct thirty miles of line, and enough poles for twenty miles have already been cut, peeled and roofed by Camp P-82, Reidsville, Georgia.

Ogeechee T. P. O. Buys Tower

The secretary-treasurer of Ogeechee T. P. O., Chatham county, has collected the money and is ready to order a steel lookout tower for the T. P. O. Mr. Elliott Reed, the secretary-treasurer, will order a 102-foot inside ladder tower. The only advantage an inside ladder tower has over an inside stairway tower is it weighs less and the freight is consequently lower, and it comes in 102-foot heights, while an inside stairway tower is 100 feet high. The ladder type is somewhat cheaper than the stairway type.

Superintendents Meeting

A camp superintendents' meeting was held in Reidsville at Camp P-82 on September 5th and superintendents from all five camps in district six were present.

The chief business of the meeting was the allocation of seed to be collected by the various camps in this district to supply a pine seed for the state nursery.

Reports of all kinds were explained and this in turn was followed by an open discussion covering all phases of fire protection and pre-suppression work being car-

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ried on at the camps in district six.

The men attending the meeting were: Superintendents C. J. Martin, P-53, Hinesville; W. F. Whatley, P-63, McRae; J. J. Walker, P-61, Soperton; A. A. Simonton, P-82, Reidsville; E. T. Gabriel, P-81, Bloomingdale, and J. B. Lattay, ECW Forester, Savannah.

J. B. Lattay at SP-5, Crawfordville

Mr. J. B. Lattay, E.C.W. forester, working out of the Savannah district office for the past year has been temporarily loaned to SP-5 camp at Crawfordville, Georgia.

Mr. Lattay will be in SP-5 for about two months training a crew to do stripping and timber type mapping. He will then return to Savannah and resume his regular work.

SEVENTH DISTRICT C. Bernard Beale, Dist. Forester Waycross

ECW Items

The eight CCC camps in this district are gathering 400 bushels of slash pine cones and 450 bushels of longleaf pine cones. Seed for the Albany State Nursery will be extracted from these cones.

Camp P-52, Homerville, has been awarded first place in the state, and competed closely for the corps area award. Lieut. Veal and Superintendent Browne were recently in receipt of commendations from General Mosely for the excellent record of morale, orderliness, and work accomplished.

Camp P-59, Fargo, has been working under conditions of extreme wetness in the woods. In some instances it has been necessary for the enrollees to walk part of the distance to the job due to inability to get trucks directly to the scene of work because of high water.

Camp P-60, Satilla Bluff, will remain in Camden county for the 4th period it now appears. The Camden TPO has certainly fought hard and unanimously to retain this camp.

Camp P-62, Baxley, has been moved out in the woods five miles northeast of Baxley. The boys are pleased with their new location. Just across from the camp site is a pasture wherein are kept several wild deer.

The tower crew of P-62, under Foreman W. W. Garwood, has completed the 4th district tower. Some of the men have developed into first-class steeplejacks.

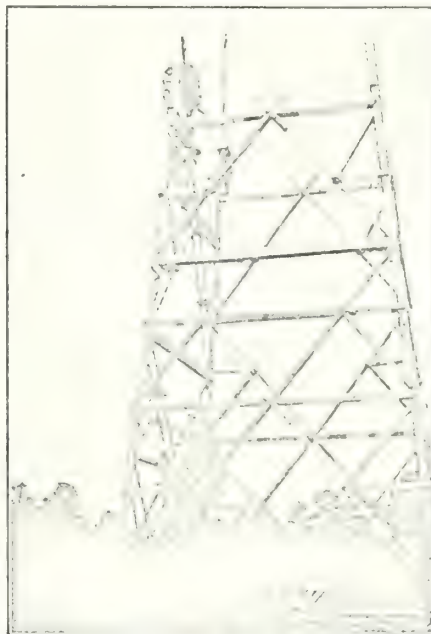
Camp P-65, Jesup, is now working on the Broadhurst tower. Telephone lines are being completed from Jesup to Odum and Grangerville. All of the men in camp, it seems, were at one time linemen or steel

erection men. Quite a few have also learned by this time how to dig up gallberry roots.

Camp P-68, Douglas, is working in three different blocks of the Coffee-Jeff Davis area. Supt. Tittle has abandoned tractor stump-pulling and reports a "mile-a-day" by hand grubbing.

Camp P-70, Nahunta, has at last established a side camp at Waynesville. Fifty enthusiastic boys are bivouacking there to try their hand at grubbing palmetto up Fendig and Browntown way. Under Foreman Wilmer Jones, a crew of men from Nahunta is now working on the Winokur tower.

Camp P-72, Waycross, moves about October 15th. Superintendent Martin has his men now working up Crawley way.



CCC Men Erecting Forest Lookout Tower in Appling County

T. P. O. ITEMS Coffee-Jeff Davis TPO

J. T. Clark, secretary of Coffee-Jeff Davis TPO, Douglas, has resigned to accept a commission at a CCC camp. Mr. Clark has done excellent work while secretary there and his resignation is regretted. L. F. Morey, formerly foreman at P-54, Albany, has been employed as secretary to succeed Mr. Clark. The TPO plans to build immediately 12 miles of telephone line between Douglas and West Green.

Grand Bay TPO

Paul Mims, recently employed as secretary of the Grand Bay TPO, Valdosta, resigned in August to accept a job in Jacksonville. No one has been selected to succeed Mr. Mims yet.

Hurricane Creek TPO

P. B. Copeland, formerly assistant county agent at Alma, has been employed as secretary of the Hurricane Creek TPO. Mr. Copeland is going after the work in earnest and hopes to induce the TPO to become immediately active. The Hurricane Creek TPO embraces Bacon, Pierce, and northern Ware counties.

Brantley TPO

At a board of directors meeting held several weeks ago, the Brantley TPO approved plans to finance maintenance of 40 miles of primary fire break. The TPO plans to acquire several fire trailers to be distributed in each community for the coming winter.

General News

The Waycross district office has been moved from 216 Parker street in the Phoenix Hotel building to the lower floor of the Plant building on Mary street.

Mosely Leaves

Geo. W. Mosely, ECW forester, with the District 7 office, Waycross, resigned September 1, to accept appointment as instructor in forestry at Abraham-Baldwin College at Tifton. Mr. Mosely leaves a vacancy hard to fill. His efficiency, accuracy and eternal loyalty to the administration of the eight CCC camps and development of TPO work in this district have rendered him almost indispensable to the district office. We wish him well in his new work.

EIGHTH DISTRICT H. D. Story, Jr., Dist. Forester Albany, Ga.

Flint River T. P. O.

At a recent meeting of the Flint River Timber Protective Organization, C. S. Sealey was elected president, Dr. E. C. Bridges vice-president and C. S. Hodges secretary-treasurer. The officers are all interested and aggressive and promise to make the organization effective.

Improvements at State Nursery

Preparations for seeding the beds of the state tree nursery at Albany are in progress. About 2,000 cubic yards of pond muck are being worked into the plant beds. This muck is about 98 per cent organic matter and will improve the physical condition of the soil now deficient in organic content. By reason of the organic matter in the soil, moisture will be conserved to supply the needs of the seedlings and result in improved growth and quality of the seedlings.

Additions to the overhead sprinkler system are to be made for the expansion of the nursery. With this added equipment, enlarged planting area, and the prospect of a large crop of tree seed, there is assurance that enough seedlings will be grown to take care of anticipated plantings for 1935-36.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE GOLD DEPOSITS OF GEORGIA

By ROY A. WILSON

(Published by permission of the Director, United States Geological Survey.)

NOTE:—The State Geologist takes great pleasure in presenting below the first of a series of five articles on the gold deposits of Georgia. These articles are the result of investigation made by the United States Geological Survey under a grant of funds from the Public Works Administration. This investigation was the first scientific study of Georgia's gold deposits since the publication of Bulletin 19 of the Georgia Geological Survey in 1909. With the amount of money available for this investigation, prospecting could be done and detailed geologic work had to be limited to the Dahlonega area where a detailed topographic map was available and where more prospecting and mining was in progress than in any other area. All active mines and prospects in the other areas were visited, however.

The State Geologist feels that this series of articles will dispel many erroneous be-

liefs in regard to the gold deposits and will point out the proper steps to take in prospecting and developing a gold mine.

Richard W. Smith, State Geologist.

Article 1.

General Features

A study of the gold deposits of Georgia by the United States Geological Survey under allotment from the Public Works Administration and with the cooperation of the Georgia Department of Forestry and Geological Development forms the basis of a series of short articles of which this is the first.

The gold deposits of Georgia (fig. 1), like those in all other parts of the world, represent a natural resource which can be wrested from the earth only by much hard labor. That as a rule rewards from this labor will be at best modest and often nil is demonstrated by the history of any gold-mining camp. The idea that the gold deposits of Georgia are largely undeveloped and that many rich ore bodies lie buried in the gold belt awaiting intelligent prospecting and development has no basis in fact. Rich deposits of gold which hand-

somely reward the efforts of those fortunate enough to uncover them are very uncommon in any mining district. With rare exceptions, gold occurs in ore bodies of relatively low grade, which require considerable capital for their development and which yield a reasonable margin of profit only with cautious and intelligent application of modern principles of prospecting, mining, and milling. The recent increase in the price of gold, in so far as it has not been accompanied by a general rise in prices, makes possible the opening of mines that could not be operated under former conditions, but all the hazards of mining still prevail.

The gold in Georgia occurs in placer and saprolite deposits and in quartz lodes in bed-rock from which these deposits were formed (fig. 2).

Placer deposits.—The gradual erosion of a gold-bearing vein or lode generally results in a mechanical concentration of the gold at favorable places in the streams that drain the area, because the gold is heavier and more resistant to physical and chemical destruction than the other minerals of the vein. The gold may be widely disseminated or locally concentrated in the alluvial deposits, its distribution depending on distance of transportation, topography, character of the stream bed, and other factors. Placer ground usually yields but a few cents to the cubic yard of alluvium: rich streaks are rarely found. It is a very general rule that the richer deposits occur next to bedrock, because the gold, being heavier than the other materials, has gradually worked its way downward to this position in the constantly shifting alluvium.

The history of most gold-mining districts shows that the placer deposits were first discovered and worked before much attention was given to "hard rock" or placer mining. This history holds true for Georgia. Placer ground is widespread over the gold belt, but nearly all the promising areas have been worked over once or several times. Occasionally rich ground has been found, but these deposits have more commonly furnished modest amounts of gold. During the nineteenth century the State was pretty thoroughly combed over by gold miners, and it is doubtful if any undiscovered placers of importance exist. Even by the time of the gold rush to California, in 1849, the placers of Georgia were mostly worked out. Small patches of unworked ground in some placer areas can still be found, and systematic prospecting might disclose new placer ground of small area.

The future of placer mining in Georgia will be a matter of reworking old deposits by modern methods, using drag-line excavators, dredges, or any system that can handle large amounts of alluvium more cheaply than was possible by more primitive methods. Working with a drag-line excavator, three or four men under favorable conditions can handle a sufficient amount of alluvium each day to make operations profitable, even where the tenor of the deposit

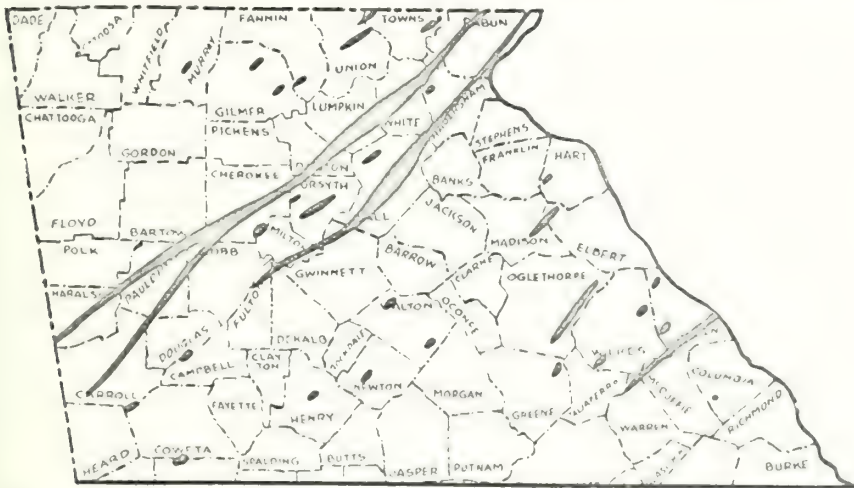


Figure 1.—Map of North Georgia showing the distribution of gold deposits (after S. P. Jones, Georgia Geol. Survey, Bull. 19, 1909)

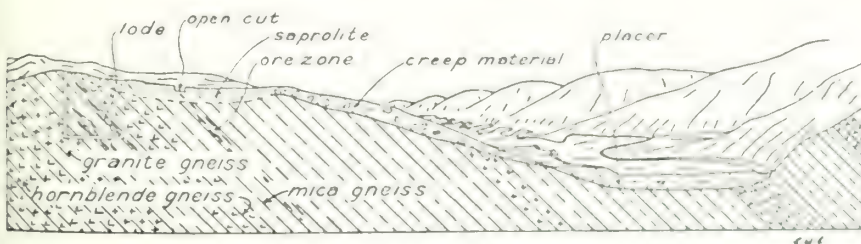


Figure 2.—Diagrammatic cross-section of a North Georgia stream valley showing the relations of lode, saprolite, and placer. (After G. W. Crickmay.)

as low as 10 or 12 cents to the cubic foot. At various localities along the gold belt old methods of placer mining are still being used, but miners who are making more than a modest daily wage by such methods are exceptional.

"Panning" is likely to yield traces or "flour" of gold in almost any part of the belt. This does not prove that the area contains valuable deposits. The presence of gold in the pan indicates simply that traces of gold exist in the alluvium, saprolite, or vein, as the case may be. Thorough sampling and prospecting is necessary to establish the true value of the deposit.

Georgia has much fine gold or "flour" of gold, which is widespread through the alluvium and weathered rocks of the gold belt. This fine gold shows up readily in panning, but its recovery is difficult and constitutes one of the major problems of gold mining in the State today. **Saprolite deposits.**—The term "saprolite" was originally defined by geologists as "weathered rock in place." Among miners in Georgia the term is generally restricted to the weathered portions of the lodes. It is important to note that the distinction between the saprolite and lode deposits rests on the physical condition of the rock and is not a primary geologic feature. In other words, that portion of the lode which has been exposed to the physical and chemical processes of weathering (hydration, etc.) is the saprolite zone. This zone passes downward into the unaltered, "hard rock" of the lode and has gradually become enriched by the mechanical concentration of gold during the slow breaking down of the lode in the process of weathering. As in the placer deposits, the richer portions of the saprolites lie next to the unaltered bedrock. However, the fine gold may be more thoroughly disseminated through the deposit.

Saprolite deposits are characteristic of the Piedmont region of the southern Appalachians because the geologic history of this region has been favorable to very slow weathering of the weathered rock, much of it remaining in place to form thick accumulations. The working of these deposits led to the development of a special type of mining, in which a hydraulic giant shooting a stream of water under high pressure was used to wash away the softer weathered rock. This type of mining was carried on extensively after the Civil War and up to about 30 years ago. With the working out of the higher-grade deposits along the gold belt, probably only a few areas remain in which hydraulic mining could be carried on profitably today.

The great problem in saprolite mining has been the satisfactory recovery of the gold disseminated in the clay. Losses due to inability to separate this flour gold from the clay have been high, sometimes 40 per cent or more. So far, attempts to find an efficient and practical process of separation have met with little success. If this

problem could be solved, certain saprolite deposits that are now considered of little value might be worked at a profit.

FORESTRY QUESTION BOX

Is organic matter on the forest floor important in preventing surface wash and in conserving soil moisture in the Coastal Plain?

Except on rolling Greenville and Orangeburg soils which contain considerable clay, rainfall in the Coastal Plain on forested areas is readily absorbed and erosion does not follow even the burning off of forest organic matter. The land is so sandy that it readily absorbs the water, or else is so level that there is no quick run off to scour away the soil.

Generally speaking, the chief advantages to the forest soil, of keeping on it a mulch of organic matter, are (a) to preserve the nitrogen of the organic matter for the use of the trees as plant food; (b) to increase the water-holding capacity of the soil within root zones; (c) to stimulate the activity of soil micro-organisms which operate to make unavailable plant food in the soil available to the trees.

The water-holding capacity of sandy soils is low, and at times, the first limiting factor in tree growth is moisture. When organic matter breaks down through decay to its smallest units, the residual particles are exceedingly small and colloidal in their physical properties. More of these small organic particles are in sandy soils than the eye reveals. The crystals of sand dominate the vision with their reflected light. But organic particles are there, each surrounded by a film of moisture and helping to increase the water-holding capacity of the soil.

But there is not a great deal of organic matter in upland sandy soils of the Coastal Plain; in fact, far from enough. All the year round warm and moist climate keeps oxidation very active, and a great part of the carbon gets away as a gas into the air.

Forest fire will keep both carbon and nitrogen compounds in the organic matter on the forest floor from becoming a part of the soil, and if continued, will eventually reduce vast areas of the Coastal Plain virtually to deposits of infertile sand.

Can Blackgum be killed by girdling the tree?

Only by very deep cutting. The blackgum has deep active sap wood that will help keep the tree alive when the cambium layer under the bark is cut. Other trees that require deep cutting are sweetgum, hickory and elm.

What American woods are used for imitation mahogany?

Those most commonly used are birth cherry, mountain mahogany, loblolly, bay and some species of cedar. Sweet gum is very popular and is now quite generally preferred to mahogany. Walnut, cherry and oak are also widely used in place of mahogany.

New Pine Products Company

The Southern Pine Products Company, with headquarters in Cleveland, Ohio, has been formed and has acquired the Wood Chemical Company and the Liberty Pine Products Company, both of which operate in Georgia. Adrian D. Joyce is president, R. H. Horsburg, treasurer, and C. M. Koly, secretary of the new company.

Scriptural Sycamore

A South Georgia negro recently gave an explanation of why the sycamore sheds its bark. "Ever since Jesus called Nicodemus to come down out of the sycamore tree," he said, "and Nicodemus slid down so quick that he skinned off the bark, the sycamore has been shedding its bark every year."

The trouble with this explanation is that it was not a sycamore tree that Nicodemus slid down, but a sycamore, a fruit tree similar to the fig.

Roasted Wood as Fuel

A new wood fuel has been developed in Sweden. Any kind of wood may be chipped and heated in a retort long enough to distill out some of the resins, tar and more volatile matter. The roasted wood remaining is low in ash, easy to regulate in burning, gives off no gas or sulphur fumes, is easy to kindle, devoid of soot or dust, and has a high heating capacity of 2,188 calories per pound. It is considered superior to coal and coke.

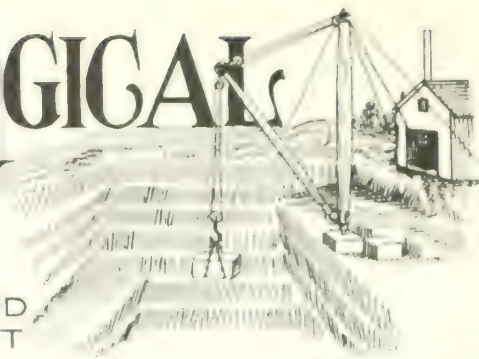
Practically all golf club heads manufactured in the United States are made from persimmon and dogwood, about 1,000 cords being used for this purpose annually. Of interest in this connection is the fact that dogwood shrinks 20 per cent from green to a very dry condition.

"The south contains 42 per cent of the volume of all pulpwood species of trees in the United States, a volume which is increasing through natural growth more rapidly than in any other nation."—13th Annual Report Southern Forest Experiment Station.

Among the slowest growing hardwoods are hornbeam, black gum, locust and post oak. Fastest growing hardwoods include willow, paper birch, wild cherry, cottonwood and elder.

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DEPARTMENT OF FORESTRY AND
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No. 11

LAND USE REPORT PLANNED BY STATE

Commissioner of Forestry and Geological Development Favors CCC Work on Private Land—Summary of Work Given

At a meeting of the Commission of Forestry and Geological Development, presided over by Chairman Governor Eugene Talmadge, held Friday, October 26, a committee on land use of the state was appointed. The purpose of the committee is to make a study of the forest area of Georgia and recommend to the commission the best use of such land and as to policies of private and public ownership.

The land use committee consists of T. G. Woolford, Atlanta; Perry Middleton, Brunswick, and Alex K. Sessions, Cogdell. The first two named are newly appointed members attending the commission for the first time.

The commission passed a resolution asking a fair share of CCC camps on privately owned lands should the CCC work be continued after April 1, 1935. A resolution of respect to Hon. Dan M. Byrd, deceased member of the commission was passed. Budget for the last quarter was fixed.

In his report to the commission, State Forester B. M. Lufburrow stated that there are now 2,068 land owners co-operating through 47 Timber Protective Organizations, with 3,379,511 acres of timber land under fire protection.

Summarizing the CCC work carried on under state supervision, Mr. Lufburrow stated that 738 miles of telephone line had been constructed, 4,042 miles of firebreak cleared, stumped, grubbed and plowed; 67,903 acres cleared of fire hazards; 577 miles of truck trails made; 4 lookout houses and 37 lookout towers erected; 28,785 man days spent fighting fires; 24 permanent buildings constructed; 5,647 miles lineal surveys run; type-mapped 3,321,048 acres of private land giving the members of the timber protective organizations definite instructions for fire control; constructed 858 bridges and planted 248 acres to trees.

State Geologist Richard W. Smith reported co-operative work with the U. S. Geological Survey on kyanite, gold and bleaching clays in Georgia.

NEW APPOINTEES NAMED FOR COMMISSION MEMBERSHIP

T. G. Woolford, Atlanta, and Perry Middleton, Brunswick, Selected By Governor Eugene Talmadge for Commission of Forestry and Geological Development

Governor Eugene Talmadge has appointed T. G. Woolford, Atlanta, to fill the unexpired term of the late Dan Byrd, and Perry Middleton, Brunswick, to succeed Leonard Rountree, Summit, as members of the Commission of the Department of Forestry and Geological Development.

Mr. Woolford has been president of the Georgia Forestry Association for several years and is a recognized leader in forestry matters in Georgia. He is chairman of the board of the Retail Credit Company, an international organization with headquarters in Atlanta. His ability as a business leader has been recognized by the United States Chamber of Commerce in which he holds the important position of director. Among his many unselfish activities in public welfare are his leadership in promoting the Gulf-Atlantic canal through Georgia and Florida and his service in connection with the Atlanta Community Chest.

Being president of the Georgia Forestry Association, an organization that has interested itself in state legislation affecting forestry, Mr. Woolford has sponsored excursions of legislators into forested areas of the state and to the pulp and paper plant in Savannah, that legislators might have first hand information of the needs of forestry. These trips are typical of the earnest and generous expressions of his great desire to render public service.

Mr. Middleton is a prominent citizen of South Georgia, owner of forest and farm lands, a naval stores operator, and vitally interested in promoting the development of the natural resources of the state. He is an honored member of the governor's staff and leader in public affairs in southeast Georgia. He is a native and continuous resident of Glynn county and has dealt first hand with many of the forestry and naval stores problems of the state.

During the winter of 1933-34, Civilian Conservation Corps employment provided relief for more than one million people.

GEORGIA CCC CAMPS ON PRIVATELY OWNED LAND

Why the Number is Reduced and How They Can be Obtained, Explained by State Forester

The number of CCC camps working on privately owned lands in Georgia was further reduced in October. Explaining why the decrease has occurred and how CCC camps can be obtained for privately owned lands, State Forester B. M. Lufburrow makes the following statement:

"While the loss is deplored, it is a matter beyond the control of the Georgia Forest Service. Every effort has been made to continue camps on privately owned lands and to increase the number.

"CCC camps are federal and not state projects. While state agencies make recommendations, the final decision on where camps are located and the number a state can have is made by federal agencies.

"An important consideration in determining the number and location of camps on privately owned land is the guarantee the state can offer that the work of the CCC camps will be maintained. The guarantee must be adequate both as to state administration and as to financial co-operation of the private land owners benefited in maintaining the CCC work.

"When appropriations for forestry were made by the State legislature early in 1933, no one anticipated the demands that would be made on the state for the administration of CCC work. The extra burden has been carried the best that the limited funds and personnel of the state forest service admit.

"Georgia has a co-operative fire control system for private land owners, known as the timber protective organization, that has been recognized by federal agencies since 1925. These organizations are considered well suited to back up state guarantees for the maintenance of CCC work. The areas controlled by these organizations have been the areas in which CCC labor has been employed on privately owned land. So much CCC work has been done on some of these areas that the private land owners have lost that they have reached the limit of their financial ability to maintain the improvements and as a consequence, the camps were moved.

"In other instances, the timber protective organizations wanted camps continued.

(Continued on page 2)

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but this has been denied by federal authorities on the ground that past and current expenditures of these organizations have not been sufficiently large to convince the federal agencies that more work would be adequately maintained.

"The funds that the state forest service have for supervising the maintenance of CCC work already done, and to be accomplished, also enter into the decision of the federal government as to the number of camps the state can have.

"In a word, the extent of CCC work on privately owned lands in Georgia depends on how far the state and private land owners are willing to back it up."

Rate Forest Checks Erosion

Rainfall washes the soil from bare and cultivated lands in the loessial upland of northern Mississippi 4,300 times as fast as from forest covered lands in the same section, according to U. S. Forest Service investigations.

The results are based on two-year determination of rain run-off at Hollywood, Mississippi. The forested land not only did not erode, but absorbed water at a rate that demonstrated the immense value of the forest as a means of flood control.

Forests and Rehabilitation

"In this national program for social and economic reconstruction and rehabilitation, intelligent and planned use of our forest land must play an important part. One third of the area of the continental United States is in forest, or land chiefly valuable for forest purposes."—F. A. Silcox, Chief Forester, U. S. Forest Service.

IS CONTROL BURNING A SOUND FOREST PRACTICE?

Burning Violates Fundamental Laws of Forest Life—Those Who Harvest Tree Products Find No Worthwhile Profit Where Fire Takes Annual Toll

The fire season is with us again. Some will purposely burn off their woods as in the past for one alleged reason or another. Among them "control burning" is prominent because some intelligent people find it easy to believe that if it is "control burning" it is somehow less objectionable.

The practice of "control burning" is most generally pursued by some of the turpentine operators, and consists of raking around trees and burning off the ground cover, this to prevent fire from reaching the chipped faces of the trees. The one purpose of raking and burning is, of course, to protect the faces and the gum accumulated in the cups. Certainly it is important to protect the trees and the cups.

If this were the only way to protect the producing trees, there would be nothing further to be said. The verdict would be in favor of burning. But there are other ways. One that has operated successfully and at lower cost than "control burning", is the method employed by the Timber Protective Organization of Georgia. Briefly, it is co-operation to prevent and control fires, in which firebreak construction, look-out towers, private telephone lines, fire fighting equipment and patrolmen are used. This system has proven more effective in protecting "faces" than control burning, for it is well known in the turpentine belt that in spite of control burning, fires do get out and burn the "faces" and the contents of cups. Pines have a habit of shedding their needles over several months, and no sooner does one rake and burn off the ground than needles cover the ground again.

The T. P. O. method is also far less expensive than the rake-and-burn method, since federal assistance is given on paying the cost.

Many turpentine operators, however, are not working trees within the bounds of areas of Timber Protective Organizations. What can they do?

The answer is use less expensive and equally, if not more, effective control measures, among them patrols. When the price of naval stores was so low, turpentine operators felt they could not stand the expense of raking and burning, they resorted to forest patrol. They generally obtained satisfactory results, mainly by spotting fires and putting them out before they gained headway.

Back firing is a method of control burning to stop fires. Of course firebreaks are desirable as bases for back firing, but when these are not present, back firing will make a fire break, and properly manned, the fire that is started for back firing can be beaten out with pine tops and kept from advancing

easier than the conflagration sweeping through the woods can be fought out.

Plowing or scraping to make a firebreak to check the approaching fire is also effective, especially in establishing a base for back firing.

The advantages of not raking and burning are many. Fires kill seedlings and prevent natural reforestation. They injure larger trees and slow up growth. Especially among hardwoods, the fires scar the trunks and let decay and insects begin their work of destruction.

Fires destroy the ground cover and thereby reduce the fertility of the soil, decrease its water holding capacity and otherwise make the soil less efficient in providing for the growth needs of the trees. Whatever reduces the vigor of trees is bound to reduce the tree's products. The greatest need of southern soils is organic matter. Burn the organic matter and you have injured the soil at its most vital point.

So many people are fearful of "rough" in the forest. The ground cover of dead sedge grass, wire grass, briars and other annuals look like a terrible fire hazard. The longer this material accumulates on the soil, the greater the hazard is considered to be. Therefore, some would use "control burning" methods every two or three years to reduce the hazard.

But how much of the sedge grass and the wire grass, the two most combustible materials, are standing two and three years and are still combustible? It will be surprising to some to find that these materials have fallen to the ground and are in such state of decay as to create no fire hazard. To the contrary, they are creating humus for the improvement of the soil. The same is true of fallen leaves and twigs. The "rough" should be regarded with pride rather than with fear.

After all, the only way to deal with fire is to keep it out of the woods, and if it breaks out, fight it by every efficient method. Burning off the woods violates fundamental laws of forest life. No method of control can keep fire from harming reforestation and tree growth.

RADIO KILLS INSECTS

It may develop as the result of a recent discovery that in the future one may take a short wave radio set and go from tree to tree to kill injurious forest insects without killing the trees.

This may come as the result of a discovery by Dr. Thomas J. Headler, Entomologist of the New Jersey Agricultural Experiment Station, who has succeeded in killing insects in glass containers by simply passing a short wave through them; also by the same process, he has killed insects in liquids, minerals, earth, paper, wood, fruit, vegetables and leaves.

It is stated that the undertaking is still in the experimental stage and details of the practical application of the short-wave insecticide have to be worked out.

APPLING COUNTY T. P. O. MAKES GOOD RECORD

Appling county and surrounding territory are very proud to state that they have bought the materials and have now completed two additional fire lookout towers to make an entire coverage of the area included in the local organization. With the original tower at Surrency and the ECW tower, or Bouie tower, already in operation, these new towers in Ten Mile Section and the fourth district will be able to spot a fire anywhere in the county before great damage can be done. The members of the Appling TPO have co-operated in every way possible to prevent fire damage to the second growth timber throughout the entire area and are very anxious to promote preservation of the bountiful supply of seed on the pine trees this year. This can only be accomplished by keeping fire out of the woods during the coming winter.

Members of Appling TPO have contributed their entire share of the cost of the new towers which have been constructed at a total cost of about \$1,600. They have installed telephones in both towers which connect to the entire telephone system, whereby the entire area, as well as the CCC camp, can be immediately notified of a forest fire. The fire loss in this area was only about 6 per cent last winter and we hope to lower this during the coming winter, if not to completely eliminate any loss whatever.

The CCC camp located in Appling county has completed 188 miles of primary firebreaks and is now completing breaks at the rate of about 20 miles per month. The timber protective organization, at a recent meeting of directors, approved a plan for maintaining the 30 per cent of these breaks, as required by the Forest Service.

In addition to the above firebreaks, the Forest Service at Camp P-62 with the CCC enrollees, has constructed 48 miles of telephone line that connect with the camp as headquarters. It has also made a comprehensive map of this county showing the timber types on all lands in the area. This map is of inestimable value in the proper preparation for stopping forest fires and preventing further spread. It is also of great value to prospective buyers of timber lands in that they can easily see the extent and type of young growth on the property without making an intensive survey.

People of this county are well pleased with the work accomplished by the CCC camp in co-operation with the Forest Service and want the camp to remain here as long as the work is carried on by the government and promises to give 100 per cent support to all projects undertaken.—N. A. Conner, Secretary-Manager, Appling County T. P. O.

A Large Layer of Mustard

As a quick soil binder to restrain erosion on a recent burned area in the Angeles National Forest, California, the federal forest service has sown 3,000 acres to mustard.

WARMING FIRES START FOREST DESTRUCTION

In this season when hunting is the pleasure of many people, it is the usual custom to gather twigs and fallen limbs to make warming fires. An opossum hunt at night when a chill is in the air, is not complete without a warming fire, around which the hunters gather and tell tales. No fault is to be found with the practice of making fires. The fault is in not suppressing the fire when the hunters leave.

Warming fires left burning in the goods by the hunters are often fanned by a breeze and sparks are carried into leaves nearby. The immediate result is a raging forest fire, sometimes sweeping through hundreds and thousands of acres. The moment of thoughtlessness and failure to douse the fire with water, or to smother it with earth, is responsible for the needless destruction of thousands of dollars of forest wealth.

Sometimes the fires are made to smoke out a 'possum or rabbit in a hollow tree. Succeeding or not, the fire is left to burn, often spreading into the woods.

Another practice, especially of thoughtless boys, is the firing of a briar patch to get a rabbit out where it can be shot. The fire is then left to burn and spread into the forest.

Hunters of quail are sometimes thoughtless about tossing burning matches into the grass, or emptying the burning embers in their pipes into the grass. Destructive fires sometimes follow in the hunter's wake.

Each year the forest fire reports of Georgia show that a large number of destructive fires are started by careless hunters. Too many warnings and reminders to be cautious with fire can not be given by word, by posted signs and the public press.

CCC Men Wage War on Tree Foe, Gypsy Moth

The western advance of the Gypsy Moth, a destructive tree enemy, is being effectively checked by CCC men and an eradication war is waging in Connecticut, Vermont and Massachusetts. According to Robert Fechner, Director of Emergency Conservation Work, the insect fighters have covered more than 250,000 acres of woodland, dispatched the enemy on 629,000 trees, eradicated millions of the moth's caterpillars and scouted 1,440 miles of roadway to remove infestations in overhanging trees so that passing vehicles would not carry the falling insects to uninfected territory.

Forestry School Largely Attended

The division of forestry of the State College of Agriculture and of the University of Georgia at Athens, has the largest attendance in its history. This is the oldest forestry school and has the largest faculty and best equipment of any in the South. Efforts directed to making it a regional school to serve all the southeast are meeting success.

WESTERN SHELTER BELT AWAITS CONGRESSIONAL ACT

The Comptroller General of the United States denied \$75,000,000 for use in planting a tree shelter belt from Canada to the pan handle of Texas, on the ground that relief funds for the drouth area, from which the tree planting funds were to be taken, were not available for any purpose other than direct and immediate relief.

Congress will have to approve an expenditure for the great "shelter belt" which is to be 1,000 miles long and 100 miles wide.

The Comptroller General has, however, approved an expenditure of \$1,000,000 from drouth relief funds to be used for establishing tree nurseries and for taking the necessary preliminary steps in launching the undertaking.

CCC CAMP RATING THIRD PERIOD OF WORK

The standing of Georgia CCC camps under the supervision of the State Forest Service for the third period, based on quantity and quality of work, and general efficiency in camp administration is as follows:

First, P-73, Towns county, C. J. Oliver, superintendent;

Second, P-67, Seminole county, T. L. Hughston, superintendent;

Third, P-63, Telfair county, W. F. Whatley, superintendent;

Fourth, P-78, Taylor county, L. B. Barrett, superintendent;

Fifth, P-72, Ware county, L. I. Martin, superintendent.

CRYSTALS IN DEAD WOOD

A curious specimen of wood brought to state forestry headquarters revealed mineral crystals throughout its cellular structure, mostly scattered, but in places clustered.

The specimen was taken from a standing, dead yellow poplar, now free from bark and decaying on the surface. The crystals were found in undecayed, as well as partially decayed parts of the structure.

The person who brought in the piece of wood reported that the dead tree was luminous at night. This, of course, is to be attributed to phosphorus.

The particles of mineral may have crystallized out of the wood, the wood, of course having taken up the minerals from the soil as plant food. It is also possible for the dead trunk to have taken up by capillary action soluble minerals in the soil, perhaps some minerals that the roots of a living tree would not have absorbed.

In the state museum at the Capitol is a tree trunk completely petrified, but in that case, the trunk was submerged and soluble minerals had infiltrated to completely fill the wood pores. The standing yellow poplar with its shining crystals did not have an opportunity to make its collection that way.

SOUTHEAST GEORGIA FOREST SURVEY BY U. S. FOREST SERVICE

A preliminary statement made by the U. S. Forest Service from the Southern Forest Experiment Station, concerning an area of 35 counties in southeast Georgia is as follows:

"The Forest Survey has completed field work on Survey Unit No. 1 in Georgia, the total area of which is 9,643,400 acres, not including the coastal marshes and the great Okefenokee swamp. This unit comprises the 35 counties that make up the southeast quarter of Georgia. The computation of the huge amount of data gathered is now under way. Of the total area, 6,976,200 acres, or 72.3 per cent, are forest land. The balance, 2,667,200 acres, or 27.7 per cent, is either agricultural land or is included in towns, cities, marshes, rights-of-way, waterways, etc. The following table shows the prevalence of the major forest types by area and by percentage of the area of forest land:

Longleaf pine	1,968,400 acres; per cent. forest land 28.2;
Longleaf-slash	630,200 acres; 9 per cent;
Slash pine	1,616,700 acres; 23.2 per cent;
Slash pine-cypress	424,700 acres; 6.1 per cent;
Turpentine pines-hardwoods	363,900 acres; 5.2 per cent;
Non-turpentine pines-hardwoods	364,000 acres; 5.2 per cent;
Bottomland and swamp hardwoods	653,300 acres; 9.4 per cent;
Upland hardwoods	20,800 acres; .3 per cent;
Scrub hardwoods	161,600 acres; 2.3 per cent;
Non-turpentine and scrub pines	587,900 acres; 8.4 per cent;
Cypress tupelo	184,700 acres; 2.7 per cent;
Total	6,976,200 acres

It is interesting to observe that 71.7 per cent. of the forest area is occupied by forest types producing naval stores. It is planned to issue a preliminary statistical report of the survey this fall.

T. P. O. SECRETARIES CONDUCT FIRE CAMPAIGN

District Forester C. B. Beale, has launched an active forest fire campaign in his district consisting of addresses by TPO secretaries, newspaper publicity and the distribution of literature.

The local timber protective organizations are assuming responsibility for carrying on an educational campaign in their territories. Each school is to be visited and students addressed about the importance of protecting the woods from fire. Community meetings of adults are used for the same purpose.

The local press is to be employed by secretaries of the TPO's for articles prepared by themselves or by the district forester.

As a result of the campaign, the TPO's in southeast Georgia hope to make a good record for fire protection this season and save CCC men from the necessity of fighting fire so that they can devote more time to developing permanent fire protection measures.

MORE PRODUCTIVE PINES

Coaxing pine trees to yield more turpentine is one of the activities of Federal workers at the Southern Forest Experiment Station of the United States Forest Service.

Several tests on the Olustee Experimental Forest, maintained by the station in north-eastern Florida, have shown consistently that better results are obtained and the injury to the trees markedly reduced by tacking tins to the trees rather than by inserting them in deep cuts.

That too frequent chipping injures the tree is shown by the fact that at the end of the second working season 41 per cent. of the trees chipped daily had ceased to yield gum, whereas only 13 per cent. of those chipped twice a week, and none of those chipped once a week, were dry faced.

Slightly greater gum yields are obtained from the second set of turpentine faces than from the first, according to studies at the Olustee Forest. Yields from faces on previously unworked trees were only from 70

to 85 per cent. of those from trees of the same size already worked with one set of faces.

"WORK MUST GO ON"— ROOSEVELT ON CCC

CCC work should be continued indefinitely, according to a statement made by President Franklin D. Roosevelt in praise of the report of Robert Fechner, director of civilian conservation work.

Quoting President Roosevelt:

"I have been greatly interested and encouraged by the fine report from your visits to CCC camps in many parts of the country.

"This kind of work must go on. I believe that the nation feels that the work of these young men is so thoroughly justified and, in addition, the benefits to the men themselves are so clear that the actual annual cost will be met without much opposition or much complaint."

CCC Strengthens Morale

The employment of some 300,000 men, mostly young, who would otherwise be idle, has constituted a social benefit to the men employed and to the communities from which they come. It is raising the morale of hundreds of thousands.—From Report of Robert Fechner, Director ECW.

WHEN IS A HUNTER'S LICENSE REQUIRED?

The answer is simple: All the time.

The attorney-general of the State of Georgia has made the ruling that every hunter is required to have a license. That means that not only the man who goes afield with gun and dogs for quail, but every fox, 'coon, and o'possum hunter must have the proper license. This holds true whether the hunter owns the dogs or has a gun or is merely with the crowd listening to the hounds. By the definition of hunting, every man jack of the crowd must have his license. We advise getting your license early in order to avoid not only the rush, but also the embarrassment, of meeting a game warden when you have no celluloid button on your coat.—*Conservation News*, Ga. Dept. Game and Fish.

Vogel Park Designated Georgia Bird Sanctuary

On October 6, Vogel State Park was dedicated as a bird sanctuary. Not only is the park area so designated, but a surrounding area, making in all 5,000 acres where bird life is to be protected from men with their guns.

Every possible encouragement is to be given to bird life in the area, in the hope that the number and kinds of birds will be increased. The birds' destruction of insect injurious to trees is one of the worth-while objectives of the undertaking.

Future Farmers Contest Included Forestry Subject

At the annual meeting of the Future Farmers of Georgia, held at the Macon Fair in October, the contest for prizes included tree identification along with seed and livestock judging. A number of the most common trees of Georgia were represented by foliage samples which the contestants undertook to identify.

Several hundred boys from rural consolidated high schools participated and made good records, evidencing progress in the students in their forestry project.

Aerial Roots of Oak

The "Service Letter" published by the Pennsylvania Department of Forests and Waters, tells of a forester attached to a CCC camp finding near Wells Tanneh Pennsylvania, oak trees with cambium layers under the bark killed by fire. Growing down through the dead cambium were roots that started above the fire scar and were trying to reach the ground, some having nearly reached their goal. The outer dead bark did not fall off until the roots forced it off.

A question might be asked. Did adventitious buds start to put out a shoot, cut off the dead bark and then decide to go down low least resistance and become a root?

FORESTRY QUESTION BOX

What are the water requirements for paper manufacture?

Plenty of clear water. Freedom from organic matter is desirable. Most paper manufacturers use alum for removing organic matter from water of surface origin. Water carrying considerable clay is also treated to remove this objectionable material. Excessive lime is not desirable, but such a condition will hardly be confronted in Georgia.

Some people in the mountains think burning off the woods increases the flow of springs. Is that possible?

To the contrary, burning off the woods decreases spring flow. Percolation of water into the ground is a slow process, and what the people you mention thought was the immediate result of woods burning was more likely the result of heavy fall and winter rains of a previous season.

The more woods mold a forest accumulates the more water it absorbs and feeds down into the springs. Fires destroy materials for making woods mold, reduce water absorption and thereby lessen spring flow.

Will a sprout from an old stump make as good a tree as growth from seed?

Growth from a seedling is preferred mainly because a sprout from the stump is likely to acquire disease that killed the parent tree, or developed in the old stump, or in the stub of a companion sprout that was removed in thinning.

When does CCC work end?

The original provisions were that CCC work would expire March 31, 1935. Strong efforts are, however, being made to establish the Civilian Conservation Corps on a permanent basis. In Georgia the Georgia Forestry Association at its annual meeting in Augusta passed strong resolutions urging the continuance of CCC work.

Which is the better time to plant tree seed, Fall or Spring?

In South Georgia it does not matter, but in the upper half of the state where freezes are sometimes hard enough to heave the little seedlings out of the ground, it is better to plant the seed in March.

The same rule holds true as to planting seedlings. In South Georgia it is safe to plant in the fall. In North Georgia, it is better to wait till spring.

In erosion work, would it be advisable to plant a mixture of black locust and pines?

According to studies made by the Central States Forest Experiment Station, Columbus, Ohio, simultaneous plantings of black locust and pines have shown "consistent failure of the conifers."

Planting of black locust with other hardwoods, according to these authorities, makes for better growth of the black locust and the hardwoods and reduces damage of borers, but conifers find the association with black locust detrimental.

Reduction in Lumber Cut

In the administration of the lumber code, the total lumber cut for the last quarter is placed at 3,073,500,000 board feet, of which 2,596,300,000 is allotted to soft woods and 477,300,000 to hardwoods. The seasonal decrease in demand and the existing surplus of 8,500,000,000 board feet has led to a reduction in the permissible cut. It is stated that it is now the policy of the lumber code authorities to adjust production to actual stocks on hand and consumption.

INTERESTING FORESTRY FACTS

(From Service Letter, Pennsylvania)

Thirty-five species of pine are native to the United States, but the bulk of pine lumber is obtained from eight of them—two northern, three southern and three western.

Quassia tree of the West Indies produces a natural fever medicine. Carved cups of this wood are filled with water, which, on standing, is impregnated with medicinal qualities of the wood. Natives then drink the liquid from the cup.

Teakwood of China and Burma contains an oily substance resistant to the penetration of water and is repellant to insects, therefore very durable.

Rosewood trees produce an oil with an odor so much like roses that many rose perfumes are made from it.

Seed from eighteen Anacardias (pine of Chili) are said to maintain one person for a whole year. Indians eat them fresh, boiled or toasted.

Nine-tenths of the world's supply of cloves come from Zanzibar and Pemba, neighboring islands off the east coast of Africa. The tree will not grow on the mainland nor on other nearby islands. The clove is the dry bud of the tree.

Querebracho wood of Argentine and Paraguay is so hard that a strong nail cannot penetrate it under heavy hammer blows. "Querebracho" means axe-breaker.

About 1100 species of trees are found in the United States.

The oldest living thing on earth is thought to be a yew tree in Chapultepec, Mexico. It is 119 feet around and 6,260 years old.

Acorns from oak trees were used as hu-

man food in Europe before anyone knew the use of grain for food.

The Life Tree of Jamaica bears leaves which continue to live after they have fallen from the tree. A portion of a leaf, if planted, will take root and grow.

FIRST DISTRICT

**Russell Franklin, Dist. Forester
Rome**

Walker County Forestry Exhibit

The future farmers of America co-operating with the Georgia Forest Service put up an exhibit at the Walker County Fair held at Lafayette October 18 to 20. The exhibit was decorated with fall leaves of varying colors and was a comparison of an area that had been burned each year and an area that had not been burned for several years. Posters outlining the difference between the two areas were put up at vantage points in the exhibit and several of the Georgia Forest Service signs were nailed to trees in the background. In the foreground of the exhibit, all the fire fighting tools commonly used in fighting forest fires were placed so that everyone could have a close inspection of these tools. Samples of the common woods of North Georgia completed the exhibit.

New School Forests

Several new schools have been calling for a survey of their school forests and much interest has been aroused in certain sections. Several of the schools are in keen competition with each other as to which will have the best school forest and some of the students are working hard to get to go to the summer camp.

T. P. O. Activities

The TPO'S are taking on new life with the advent of the fall season and the subsequent fire danger. The Ellijay TPO has been undergoing quite a change since the death of their patrolman and the people are waking up to the fact that they have a good TPO and are taking more interest in these activities than formerly. Practically all the TPO's are undergoing a slight change in management and the members are in hopes that this will serve to enlarge their organizations.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Tar City T. P. O.

The Tar City TPO has assessed each member two cents per acre and will use the money to reseed primary firebreaks during the fall and winter season.

The TPO will use the tractor, dryer and plow that was used in the original

construction of the breaks by the camp at Reidsville, but the organization will pay for all gasoline, oil and minor repairs and labor necessary in the operation of the machinery. They plan to also construct enough secondary firebreaks to break the blocks of timber land into areas not to exceed 100 acres.

Ogeechee T. P. O.

The Ogeechee TPO bought a 102 foot tower. The tower has arrived and will be erected at an early date by labor from the camp located at Bloomingdale.

The TPO members agreed to donate enough heart cypress telephone poles to construct thirty or thirty-five miles of line connecting the tower with strategic points where fire fighters will be available.

Seed Collection

The Savannah district was allotted 275 pounds of slash pine, 275 pounds of longleaf pine and fifty of loblolly pine seed to collect. The quantity of seed was reallocated to the camps in the district, and a tobacco warehouse in the district at Vidalia was secured to store the cones during the curing, drying and extraction stages.

To date, over two thousand bushels of cones covering all species have been collected. After the seed have been extracted from the cones, they will be carried to Reidsville, where they will be cleaned and graded before they are ready to be turned over to the state nursery at Albany.

A machine two feet in diameter and three feet long, mounted with a crank, has been constructed to shake the seed from the cones. After this process is over, the wings will be rubbed off and all this mass run through a home-made blower, which will separate the faulty seed and wings from the good seed. The longleaf seed will retain their wings, as they will not readily separate from the seed, besides there is possibility of the seed being crushed in the process of wing removal.

E. C. W. Notes

The five CCC camps and one side camp located in District Six will remain in their present location through the fourth work period. There is still much truck trail, fire break, telephone and tower work to be done during the next five months.

Camp P-82 received 154 men from Camp Dix in New Jersey, October 19th, which will bring the camp strength up to 264 men. The camp superintendent will have a problem to solve as to how he can haul all these men on seven trucks.

Mr. C. F. Powers was glad to see all of these men come in, as he is football coach, in addition to being an up and coming forest engineer. Charlie could use several more 190 pound backs and line men, in addition to the ones he now has on the squad, and he hopes to be able to get them from the large list of new arrivals.

Camp P-5 3, Hinesville, will have completed by the end of October, type mapping covering over 400,000 acres in Liberty and Long counties. They have already turned into the district office completed and colored maps covering approximately all of the above amount of land.

The side camp located in Swainsboro, which uses Camp P-61 as a base camp reports good progress in fire break construction for the first thirty days of operation on lands listed in the Emanuel County TPO. With a crew of 45 men, they constructed 15 miles of firebreak in 22 working days. The firebreaks were plowed and were not thrown up by a grader.

It seems that the Savannah District office will be without the services of an ECW forester for the remainder of the fourth work period. Mr. Lattay, who was loaned to Sp-5 temporarily will be held in the Waycross district on type map work.

SEVENTH DISTRICT C. Bernard Beale, Dist. Forester Waycross

T. P. O. Expenditures

Expenditures were reported by the following TPO's for the quarter ending September 30: Consolidated TPO, \$1,774.00; Kinderlough TPO, \$150.00; Suwanee TPO, \$7,922.00; Camden TPO, \$359.00; Hurricane Creek TPO, \$114.00; Brantley TPO, \$486.00; Appling TPO, \$711.00; Coffee-Jeff Davis TPO, \$781.00; Wayne TPO, \$1,464.00. A total of \$13,761.00 was spent by nine TPO's in this district for fire control activities during the past quarter.

Firebreak Contracting

Raulerson and McCain, firebreak contractors of Foley, Fla., who did considerable secondary firebreak construction in this district last winter, are in this territory again and expect to contract a considerable mileage for plowing this fall. Their rate is \$3.00 per mile and they construct a firebreak 7 feet in width with a Hester plow and crawler type tractor. Anyone wishing to have any of this plowing done may get in touch with Messrs. Raulerson and McCain through the district office at Waycross.

C. C. C. Items

Camp P-72, Waycross, moved to Homeland, near Folkston, the latter part of October. This camp is now known as P-84, Charlton.

Camp P-70, Nahunta has some cracker-jack tree-choppers, as was demonstrated recently in some thinning demonstrations put on by the Brantley county agent and the district forester. Verily, the boys could chop down the trees much faster than

ye district forester could decide which trees were to be chopped.

Camp P-68, Douglas, is "tearing up ground" fast in Coffee and Jeff Davis counties. Building firebreaks up there is mere child's play, though, to them, since they were trained on the high palmetto and gallberry lands of south Charlton county.

Camp P-65, Jesup, is toiling away in the Penholloway Creek region now. One veteran recently remarked that he worked for two weeks around Broadhurst way without being in sight of a house. Some woods!

Camp P-62, Baxley, is soon to be housed in barracks, it is reported.

Camp P-60, Woodbine, is to remain at Satilla Bluff for the winter.

Camp P-59, Fargo, will be prepared to take care of fires this winter as fast as they come. Four of the trucks have been equipped with radio receivers.

Camp P-52, Homerville, is building 30 more miles of telephone line, the materials being furnished by the Consolidated TPO. The Dupont tower is also in process of being moved from Dupont to Ryal's camp.

T. P. O. Items

L. F. Morey, secretary of the Coffee-Jeff Davis TPO, reports that the TPO has purchased a McCormick-Deering tractor and a Taylor 2-disc plow for constructing secondary firebreaks for TPO members at cost. This is a fine step forward and it is hoped other TPO's will fall in line with the same idea.

J. O. Rodgers, secretary of the Consolidated TPO reports that the TPO has purchased 3 miles of wire and materials for additional telephone line construction. All members desiring secondary firebreak plowing should contact Mr. Rodgers.

J. M. DuPuis, formerly foreman at P-Albany, has taken up his duties as secretary of the Appling TPO, with headquarters at Baxley. The Appling TPO was have had a barbecue on Thursday, October 25, preparations having been made for 4,000 lbs. of meat. Dr. Herty was invited to make an address but could not be there. An attendance of farmers, landowners, tenting men and others aggregating 4,000 people was anticipated.

E. L. Knight, secretary of the Wayne TPO, in co-operation with County Agent Jack Chaffin and the district forester, held fire prevention meetings at four schools in Wayne county recently. Field demonstrations of fire damage were also given. Messrs. W. C. Rogers and A. J. Hopson attended and gave talks at the meetings.

(Continued on Page 8, Column 2)

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE GOLD DEPOSITS OF GEORGIA

By ROY A. WILSON

(Published by permission of the Director,
United States Geological Survey)

Article 2

General Features (continued)

Lode mining.—Lode mining gradually attracted more attention as the higher-grade placer and saprolite deposits along the gold belt of Georgia became exhausted. The total amount of underground development in the state is very small compared with that in other mining regions. Much of it has been "gophering"—the digging by hand in the oxidized and partly weathered zone of the lodes for rich quartz stringers and pockets. Although a few mines have operated on a fairly extensive scale and pene-

posits with the hope of finding profitable ore bodies. In areas having favorable geologic conditions this is a definite possibility, but there is no present basis in fact for the statement that the gold belt of Georgia contains a second "Mother Lode."

In this connection it is important to note that the lodes of the gold belt are characterized by small, very irregularly distributed veins in which the small ore shoots are separated by much barren material (fig. 3).

The difficulties of mining such a deposit are apparent.

At the time of these studies none of the deeper mines in the state was accessible. Most of them had been abandoned for a long period. Reliable statistics of production either have not been kept or are not available. Underground maps are generalized and show little in the way of reliable geology. Word-of-mouth information must be carefully sifted for data that are accurate. The owners or past operators of these mines are prone to err on the side of

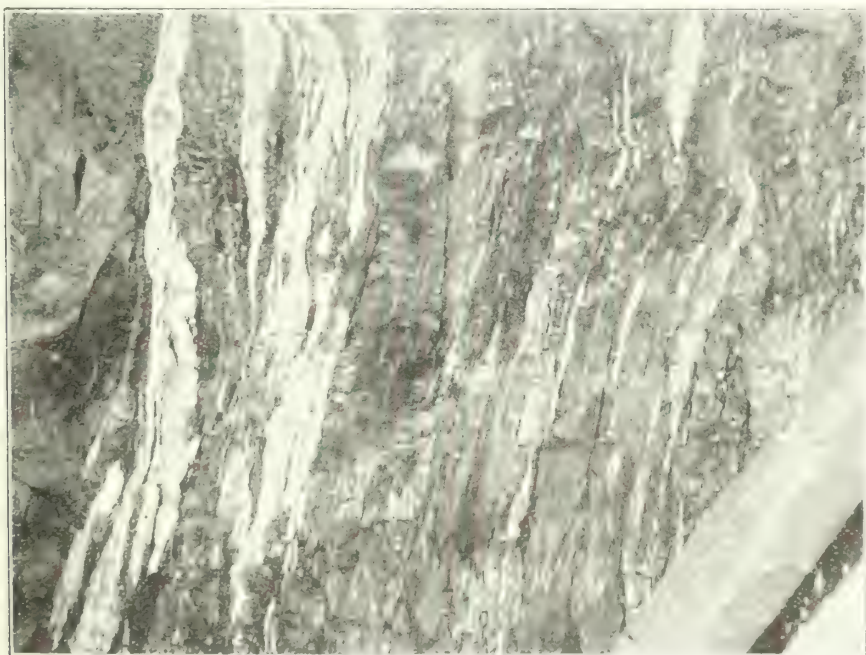


Figure 3.—View of lode exposed in Black shaft of Cherokee mine in Cherokee county. Shows typical arrangement of small quartz veins intermixed with altered country rock. Photograph by R. A. Newton.

trated to depths of several hundred feet below the oxidized zone into the sulphide ore bodies, the lode miners have generally abandoned their efforts at depths of 100 feet or less. Increased difficulties of mining and depletion of richer ore are the two common factors behind such abandonment.

The limited mining of the quartz lodes explains the widespread belief that the future of gold mining in Georgia lies in the exploration of the deeper parts of the de-

undue optimism or have forgotten essential details. A mine that can be operated at a profit, and especially one that still contains extensive bodies of rich ore, is not likely to be abandoned. Litigation, accidental flooding, etc., are exceptional causes. The assumption is reasonable that most of these deeper mines were abandoned because they failed to yield a profit. Even if they were profitable at first, the ore probably became too lean to be workable at depths

It may be that some of these old mines, if reopened and properly explored, could be operated at a profit under present economic conditions if modern methods of mining and milling were utilized. The geologic data indicate that exploration will probably show low-grade ore bodies, with here and there a richer pocket. The profit must ordinarily come from mining these low grade ore bodies. With very rare exceptions, the discovery of rich pockets of gold represents something unexpected and unplanned for; they are the occasional "lucky finds" and should be so considered in the proper valuation of the property.

Too much emphasis should not be placed upon the past history of a mine. The richer ore may have been mined out. The character of the remaining ore is the all-important question. No mine is truly on a paying basis until sufficient exploratory work has proved the presence of ore bodies of sufficient size and value to guarantee a return of the capital investment, plus costs of operation, plus a reasonable margin of profit. Until that is established the mine is merely a prospect, subject to all the hazards attendant on the lack of knowledge as to what lies below. The advice of competent mining engineers and geologists will reduce these hazards somewhat but by no means eliminate them.

In addition to geologic data, sampling and assaying of the explored ore bodies is important. Gold veins, especially, show wide variations in value, even within a distance of a few feet, and the mean or average of the assayed samples will generally be much lower than the highest results obtained. Emphasizing the highest assays obtained in sampling gives an optimistic picture of the property's value which is not warranted. Selective or haphazard sampling of the ore body is equally worthless. Proper sampling requires the utmost caution and skill and is very often an expensive procedure, costing hundreds or even several thousand dollars. If the deposit sampled is of fairly large size. It is obvious that until sufficient exploration has been carried on to open up a considerable portion of the vein or lode, the most accurate sampling gives only a partial picture of the true value of the ore body. A detailed mine map showing the exact locality of each sample in the shafts, crosscuts, drifts, etc., and an assay sheet to accompany this map are absolutely essential.

The question of the depth to which profitable ore bodies extend in the gold belt of Georgia is still an open one. The answer to this question lies largely in what future underground development will disclose. Present knowledge does not indicate extensive and rich ore bodies in the deeper portions of the lodes. The known facts show that in areas where conditions of mineralization have been favorable, ore bodies that may be profitably mined lie below the water table in the sulphide zone but that only very locally do they contain small rich pockets of gold.

Mining cannot be carried on at a profit everywhere in the Georgia gold belt. There are large areas which show very little or no mineralization. In other areas the gold, though widely distributed, is present in so small an amount that mining operations of any type cannot be profitable, regardless of the present price of gold or other favorable economic factors.

It is frequently stated that certain mines are not operating because of the difficulty of treating the sulphide ores. There is no difficulty in treating sulphide ores if the value is there. Modern metallurgical practices are readily available to any operator who is interested. The "free gold," or that which is not intimately associated with the sulphides (iron pyrite, etc.), has been largely mined in the past because the simpler metallurgy and cheaper mining of the oxidized free-milling ore allow on the average a profit from a lower grade of material than can be worked in the sulphide zone.

GEORGIA'S BLEACHING CLAY INVESTIGATION UNDER WAY

Work was begun October 8th on an investigation of the bleaching clay and fullers earth deposits of Georgia by the United States Geological Survey in co-operation with the Division of Geology of Georgia Department of Forestry and Geological Development. The study, which is made possible by a direct grant of Public Works funds to the federal survey, is in charge of Dr. Harry Bay, who has just finished similar investigations in South Carolina, Florida, Alabama, and Mississippi. Dr. Bay is a graduate of Iowa State University and has had several years of experience in developing deposits of bleaching clays.

Two types of fullers earths or bleaching clays, are now being commercially mined in Georgia. Those of the Attapulgus region in Decatur county in South Georgia are being used for the bleaching of petroleum oils. New deposits of this type have recently been discovered in the northern part of Thomas county. Another type of bleaching clay is being mined in Twiggs and Wilkinson counties of Middle Georgia for use in bleaching cotton seed oil and other types of vegetable oils. Other types of bleaching clays in Georgia which will be studied by Dr. Bay are the bentonite deposits of Walker and Dade counties in northwest Georgia, and the fullers earth deposits of Stewart county and bleaching clays of Crisp county in middle Georgia. Samples of these clays will be collected and tested in comparison with the bleaching clays now in commercial use. The work will take about two months for completion.

Fires weaken trees and increase insect damage, and trees killed by insects make fire damage greater.

T. P. O. ITEMS

(Continued from Page 6, Column 3)

screw worm control. Mr. W. C. Rogers recently purchased an International T-D40 tractor and Hester 5-disc plow for plowing secondary firebreaks.

J. H. Warren, secretary of the Brantley TPO, Nahunta, with County Agent W. T. Clary and the district forester, gave a series of talks on fire prevention and thinning at Hoboken, Hortense, Nahunta and Waynesville. Mr. Clary arranged for the demonstrations and Superintendent Rogers of P-70, furnished CCC men for doing the thinning. Four thinning plots will be made permanent demonstrations.

At a recent meeting of the Board of Directors of the Hurricane Creek TPO, at Alma, it is reported by Secretary P. B. Copeland, that plans were considered for the purchase of a plow and tractor by the TPO for plowing secondary breaks for members. An oyster supper was served at the meeting.

The board of directors of Grand Bay TPO held a meeting at Valdosta Chamber of Commerce recently and voted to procure another secretary to replace Paul Mims, resigned. It was expected to have a new secretary on the job by November 1.

D. L. Branyan, temporary secretary of the Berrien-Cook TPO, reports that the Nashville Civic Club has engaged two men to increase the membership of the TPO.

NAVAL STORES ALLOTMENT

A production of 450,000 barrels of gum turpentine and its equivalent in gum rosin has been set for 1935 by the Control Committee in charge of the federal marketing agreement. Production in 1934 was on the basis of 464,000 barrels.

A meeting of the Control Committee November 1 will make individual allotments to processors, effective January 1, 1935.

Appalachian Trail Club

At the annual meeting of the Appalachian Trail Club of Georgia, held at Cloudland in October, a largely attended meeting was delighted with an address of Benton Mac Kaye, formerly of Washington, now with the T. V. A., Knoxville, Tenn. Warner Hall, Decatur, was re-elected president.

To Try Australian Pines

The State Forest Service of Florida has arranged to make several plantings of the Australian pine to test its adaptability to various parts of the state, in the hope that a very rapid growing species may be developed as a source of wood pulp.

NATIONAL FORESTRY IMPORTANT SESSIONS

The annual meetings of the National Association of State Foresters and the American Forestry Association, held at Knoxville, Tennessee, in October, were well attended and discussed many phases of new deal forestry. Georgia had several delegates in attendance.

Public acquisition, both federal and state, were urged by U. S. Chief Forester Silcox and others. Purchase of forest lands for state forests with federal funds was advocated by state foresters. Federal Forestry co-operation with states, only through state forestry agencies, was recommended.

Continuation of CCC work was advocated and several recommendations were made as to changes in the operation of the camps. Among them was a plea for CCC camp work on privately owned lands with the federal agencies to set up requirements for the states to meet in this type of work. Constant enrollment for replacement of men in camps to keep up the working force was advocated, also the employment of trained cooks.

The state foresters re-elected the old officers.

The American Forestry Association heard many noted speakers, including H. S. Graves, dean of the Yale School of Forestry, and president of the association; Dr. Arthur E. Morgan, Chairman, Tennessee Valley Authority; Earle S. Draper, planning and housing director of T. V. A.; Edward C. M. Richards, forester, T. V. A.; James K. G. McClure, Jr., president North Carolina Forestry Association; F. A. Silcox, Chief U. S. Forest Service; Robert Fechner, Director E. C. W.; James O. Hazard, State Forester of Tennessee; J. N. Darling, Chief U. S. Biological Survey; Robert Marshall, Forester U. S. Indian Service; Arno B. Cammerer, Director National Park Service.

The association made a trip to Norris dam and the model city of Norris; inspected CCC and forestry work in the region. Another trip was to the Great Smoky Mountain National Park.

The association meeting was well attended and considered one of the best of the 29 held during the history of the organization.

Ford to Grow Tung Oil Trees Near Savannah, Georgia

On his 80,000 acres in McIntosh county, near Savannah, Georgia, Henry Ford, the automobile manufacturer, is to grow tung oil trees. He is beginning by planting 200 acres this year.

Observations made at tree nurseries in Florida show much larger seedlings from seed gathered on hammock land in North Florida than those from seed gathered in Southern Florida.



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No. 12

GUM PRODUCTS SURVEY SOUTHEAST GEORGIA AREA

Advance Release of Data by U. S. Forest Service Survey for Thirty- five Counties of Georgia—Work Done Under Capt. I. F. Eldredge

One of the first units selected for the federal forest survey was 35 counties in southeast Georgia. Information in advance of the complete report has been released by Capt. I. F. Eldredge, in charge of the survey, with headquarters at the Southern Forest Experiment Station, New Orleans.

The counties included are Screven, Effingham, Chatham, Bryan, Liberty, McIntosh, Glynn, Camden, Charlton, Brantley, Wayne, Long, Bulloch, Jenkins, Candler, Evans, Tattnall, Appling, Bacon, Pierce, Ware, Clinch, Echols, Atkinson, Coffee, Jeff Davis, Telfair, Toombs, Montgomery, Wheeler, Treutlen, Emanuel, Johnson, Laurens, Dodge. The Okefenokee swamp area in Charlton county, coastal islands and marsh lands are not included.

According to the survey, 6,976,000 acres of land in the area are covered with forest growth. Of this area 5,544,000 acres, or approximately 79 per cent, are included as turpentine forests and 3,032,000 acres, or 55 per cent, are being worked for naval stores.

Seven Kinds of Producers

1. *Operator*—A person who maintains a turpentine still and processes crude gum from his own or leased timber exclusively. This class of producer works 1,099,000 acres, or 36 per cent and 1,768.6 crops, or 32 per cent of all crops.

2. *Operator and Farmer*—An operator who combines farming with turpentering to the extent of at least half of his time. This class operates 24,000 acres, or 1 per cent of the area and 55 crops, or 1 per cent of all crops.

3. *Operator and Gum Buyer*—An operator who, in addition to distilling gum from his own or leased timber, buys crude gum from producers, and, after processing sells it in his own name. This class works 673,000 acres, or 22 per cent of the area and 1,005.5 crops, or 25 per cent of all crops.

4. *Operator and Custom Distiller*—An operator who, in addition to distilling gum from his own or leased timber, processes crude gum for producers who market the

turpentine and rosin in their own names. This class handles 155,000 acres, 5 per cent of the area, and 291.6 crops, or 5 per cent of all crops.

5. *Operator, Gum Buyer and Custom Distiller*—An operator who is both a gum buyer and a custom distiller. This class handles 265,000 acres, or 9 per cent of the area and works 531.1 crops or 10 per cent of all crops.

6. *Gum Producer-Seller*—A person who does not maintain a still but who works his own or leased timber for crude gum, which he sells to stillers. This class handles 585,000 acres, or 19 per cent of the area, and works 993.4 crops or 18 per cent of all crops.

7. *Gum Producer-Shipper*—A person without a still who works his own or leased timber for crude gum which is custom-stilled and marketed in his own name. This class handles 231,000 acres, or 8 per cent of the area and works 511.4 crops, or 9 per cent.

It is announced that the figures given out may be slightly modified in checking computations.

The area treated in this report is a region of great naval stores production and a region of the most progressive methods.

In this area 8,955 operators are recorded, 175 being classed as "operators"; 11 as "operator-farmer"; 158 as "operator and gum buyer"; 52 as "operator and custom-stillers"; 96 as "operator, gum-buyer and custom distiller"; 7,854 as "gum-producer-seller"; and 609 as "gum-producer-shipper."

SOUTHERN PINE PRODUCES A GOOD CARDBOARD

The Mobile Paper Mills Company has been purchasing from Sweden pulp for making cardboard. The discovery of Dr. Chas. H. Herty that southern pines make good white pulp led R. E. Hartman, president of the Mobile concern, to try some of it. A supply was obtained from the Pulp and Paper Laboratory at Savannah, Georgia. It met every requirement. A fine grade of cardboard "liner" was made.

The outcome is that the Mobile Paper Company has purchased new machinery and is planning an expansion of the plant to make cardboard from southern pine pulp.

OPPOSES FEDERAL PURCHASE FOREST LANDS OF GEORGIA

T. G. Woolford, President Georgia Forestry Association, Defines Position—Wants Georgians to Profit from States Great Forest Resources

The Georgia Forestry Association will oppose any effort to amend the state's land purchase enabling act whereby the Federal Government would be allowed to buy forest land for commercial development, according to T. G. Woolford, president of the Georgia Forestry Association, executive head of the Retail Credit Company, and a Vice President of the United States Chamber of Commerce.

"The State," said Mr. Woolford, "has an enabling act under which the Federal Government can purchase land in the northern part of the state to use as national forests, primarily for watershed control purposes. This act was changed at the last session of the State Legislature to allow federal purchase of the Okefenokee swamp area in southern Georgia.

"It may be advisable to amend the act to meet the needs of further watershed control, or the purchase of limited areas for experimental and demonstrational forests."

"The Georgia Forestry Association," continued Mr. Woolford, "has committed itself in a set of resolutions to oppose federal acquisition of forest lands in Georgia for commercial development on the ground that it would remove lands from taxation and put the Federal Government in competition with private owners of forest lands. The association, however, does not oppose federal purchase of limited acreages of forest land for experimental and demonstrational purposes.

"Georgia's forest lands have produced great wealth for Georgia, and are actually yielding an income second only to agriculture. The time seems to be rapidly approaching when southern pines will be the country's source of paper, pasteboard boxes and a variety of other cellulose products, to greatly enhance the value of Georgia. My contention is that the citizens of Georgia are entitled to this wealth and should not now part with it for a song to

(Continued on page 2)

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the Federal Government," said Mr. Woolford.

"I am thoroughly convinced," continued Mr. Woolford, "that there is no place in the world where forestry can be practiced with greater success than in the south. Think of the great variety of forestry incomes—lumber, naval stores, pulp for paper and other cellulose products, poles, piling, crossties, veneer, etc. Then take into consideration the rapid growing species of trees favored by climate and soil to produce a short rotation of tree crops. Is Georgia going to close its eyes to these advantages and sell its birthright?"

"Those who advocate federal purchase of forest lands claim that private owners have failed to care for and develop forest resources. I have challenged advocates of federal ownership of forest lands—and now repeat it—to show where federal forests are being better handled than a number of private forests in Georgia.

"True," said Mr. Woolford, "many private land owners have failed to make the most of their forest lands. But is this the fault of the American system of private ownership? Is it not due to conditions that have compelled the land owners' course?"

"A commission was sent to Europe this year by the Oberland Trust of the Carl Shurz Memorial Foundation to study industrial forestry carried on for several generations on privately owned land with marked success.

"In a report made by R. B. Goodman, a member of the committee, who went to Europe as a believer in public ownership and came back an advocate of private ownership, attention is directed to the plan of continuous employment between farm and

forest, a flexible but adequate and enforceable regulation of forest practice, including a universal balance of annual cut and annual increment, a mutual acceptance by the state and private owner of responsibilities of all land ownership, and a system of taxation appropriate to sustained yield forest management.

"Regarding the basis of taxation, this significant statement of his report is 'Forest sites are classified and appraised for tax purposes in relation, not to the volume of stand, but solely in relation to the net income the property yields. We found valuations around \$100 per acre for land to forest use. These values indicated that permanent sustained yield forestry does pay.'"

"If taxes based on net income allows of successful forestry on land worth \$100 per acre in Germany, ought it not work on land of much less value in Georgia? Would not the Georgia land owner be able to hold timber land that he now loses under the land system of taxation and tax sales, if at least a greater portion of the taxes were collected on yields? And would the land owner not be encouraged by the yield tax system to develop his forest resources? In fact, would the state and the county in the long run not obtain larger revenues by this kind of taxation?"

"Yield tax is certainly one method of lightening the land tax burden of Georgia. It would, in a measure, aid the private land owner to compete with the tax-free national forest lands already owned and operated by the federal government, and in doing so it would remove in part one enforced disadvantage that has contributed to the failure of many private land owners in developing their timber resources."

"What do you think of the CCC camps?" Mr. Woolford was asked. "These have done a wonderfully constructive piece of work in several ways; first, they have stimulated activity in forest protection and preservation, fire prevention, etc. They have provided work for the unemployed and while affording this relief have built up strong bodies and active minds in a large group of worth while young men. We believe that this CCC work has been of inestimable value to the private forest interests of the country, particularly of the South.

"In this connection I would like to express my appreciation of the army for the fine work that it has done in handling its part of the program and hope most sincerely that in any continuation of this work the army will be allowed to continue its exceedingly efficient cooperation."

Donald R. Brewster, Memphis, has been appointed forest code examiner for the Southern and Appalachian hardwood areas, by Joseph C. Kircher, regional U. S. Forester, Atlanta. Mr. Brewster's headquarters will be at Memphis.

FORESTS CONSERVE MOISTURE ON ADJOINING FIELDS

Some Considerations of Effect of Shelter Belt Forests on Agricultural Lands of Semi-Arid Regions

The proposed shelter belt in the semi-arid west is starting anew a discussion of the effect of forests on climate. A popular conception is that forests increase rainfall. This probably grows out of observations that the greatest precipitation is usually in forested areas. For instance, the greatest precipitation anywhere in the United States is in the heavily wooded region of the southern Appalachian mountains.

Among scientists the prevailing opinion seems to be that forests do not affect the climate except in a limited way within the forest and in neighboring fields. It is true that humidity is greater in forests than in open area. It is also well established that the temperature in the forest is cooler than in open areas.

Hot air of the neighboring fields rises and cooler and moister air moves out of the nearby forest along the surface of the fields. The effect is to increase the humidity of the field surface and check moisture loss of the field through heat radiation. This conserves soil moisture.

Since soil moisture is a chief consideration in semi-arid areas, adequate forested areas would therefore appear to be a means of checking a loss of moisture of nearby fields.

In addition, trees break the force of winds and reduce their toll of soil moisture. This is often heavy.

Other local influences of the forest which authorities have advanced are the effect of forests on snow drifts in the forests and adjoining fields. Snow is better distributed and on melting, the water is more evenly distributed and absorbed than when left in drifts. Also, as a result, less erosion is experienced from melted snow.

Forest soil is quite absorptive, and not only the water of snow, but rainfall, finds opportunity to percolate down into the forest soil to feed springs, wells, streams and lakes, and make more water available for irrigation. The fact that more water is absorbed by forest soil also helps to create greater humidity in the forest with all that means to crops of adjoining fields, as previously explained.

The above considerations leave no doubt about the value of the forest as a conserve of moisture in its immediate area and vicinity, which after all, is an important objective.

In a report made in 1877, Franklin I. Hough expressed as a theory that prairies were made treeless by annual fires of Indians who desired grass to attract deer.

PRUNING YOUNG FORESTS ADDS TO TREE VALUES

Idle Farm Labor in Winter Months Can Be Gainfully Employed in Forest Thinning

Does it pay to prune young pine trees?

In an analysis by federal foresters of lumber cut from 4½ acres in a 42 year old stand of loblolly pine in Louisiana in 1930, it was estimated that, had the trees been pruned of lateral branches for a height of 16 feet when they were 4 or 5 inches in diameter, the value of the lumber would have been increased about \$100 per acre over the value of that actually cut. If this had been done, the percentage of lumber classed in the best grades would have been increased 2½ per cent to 42 per cent. The increased value discounted at 6 per cent compound interest would have allowed an expenditure of \$17 per acre 30 years earlier for pruning.

The actual cost of pruning will run well below \$17 per acre. Of course, only trees that are to be left to grow to large size need be pruned. Thinning should therefore precede or accompany pruning.

Where trees grow close together, a process of natural pruning goes on. The lower limbs die and drop off. Is it worth while to prune where natural pruning is taking place? The sooner the limbs are cut, the smaller the knots left in the trunk will be. If they are left to die off, the knots will be larger than if the limbs are cut off while still alive.

It is a good practice to even cut off dead branches, because the longer they are left on the tree, the longer it will take for the scars to heal and the larger the knots will be.

In pruning limbs, cut them off as close as possible to the trunk. If a stub is left, the removal of the limb has served no good purpose until the stub decays, for the stub causes a knot as much as the limb. But when the limb is cut close, the tree immediately heals over and makes a minimum knot.

When should pruning begin, is a question frequently asked. If pruning is not too heavy, it can begin in the case of pines as a rule when the trees are 15 to 20 feet high. It would be an advantage to cut off dead limbs earlier. If the trees are not spaced closely enough to promote natural pruning, and are putting out large limbs near the ground, they should be pruned earlier.

Pruning will slow down tree growth for a time, and excessive pruning will produce a shock from which some trees may not recover. In the case of pines, it is considered advisable never to cut off more than one-third of the leaf bearing surface at any one time.

While it is true that the greater the leaf surface, the faster a tree will grow, too much of the growth may be going into limbs. It is then better for the sake of the tree

trunk to check the lower limb growth and even though it may slow down the development of the trunk, the loss is more than made up in the quality of its wood.

Both pruning and thinning, of course, should be carried on in the dormant period of fall and winter, else the pine beetle, attracted by the odor of fresh cut wood, will become a serious pest.

EFFECT OF FOREST FIRE ON LONG LEAF PINE GROWTH

Results of Forest Experiment Station in Longleaf Pine Studies— Marked Decrease Noted from Annual Burning

A report of three years' results of annual burning of a longleaf pine area, compared with unburned trees is given by A. L. McKinney of the Appalachian Experiment Station in the *Journal of Forestry*, issue of November 1934.

The average age of the pines was 31 years. Previous to establishing the test, the area was not burned over for 12 years. On 19¼ acres the forest was burned over annually, and on a similar adjoining area, fire was kept out.

The two areas were not fully stocked, so that it was necessary in developing data, to divide up the area into 1-40 acre plots, according to the density of the stand.

Diameter measurements were made at 4½ feet from the ground, at the beginning of the experiment and each year thereafter. Height measurements were also made.

Quoting from the report. "From the table it is evident that in every density class where comparisons could be made, the mean basal area growth (inside bark) per tree was materially less on the annually burned sub-plots, the reduction ranging from 36 to 75 per cent of the growth on the unburned sub-plots. The reduction in height growth is not so striking, although seven of the eight comparisons indicate apparent reduction due to the fires."

Comparisons were also made on the basis of diameter classes. Trees of all diameters showed slower growth as a result of fire except the 8-inch diameter class where the difference was not significant.

In height growth the effect of fire was greater with small trees than with large.

U. S. Erosion Toll

The toll of erosion to date amounts to 35 million acres of formerly cultivated land ruined and abandoned, 125 million acres of that now cultivated stripped of its own productive top soil, and 100 million acres more of cultivated land approaching a soil denuded condition.—H. H. Bennett, Director, Soil Erosion Service, U. S. Department of the Interior.

FUEL AND FARM TIMBER FOR GEORGIA HOMESTEADS

Eighteen Cords Per Family Annual Fuel Need—Full Timber Supply Calls for Nearly 30 Acres of For- est Land Per Farm

The average farm family of Georgia uses 18 cords of fuel wood annually. Most forested lands of the state are not growing a cord of wood per acre annually, though on the average most wooded acres in Georgia could do so and even better.

Poor stands, fires and poor handling, slow growing species account for the fact that Georgia farmers gather for fuel on the average, more wood than grows each year on 18 acres.

A fuel subsistence homestead in Georgia should, therefore, average more than 18 acres of woodland, perhaps 22 to 24 acres.

In most cases forests are needed for more than fuel on a farmstead in Georgia. As a rule, it is the part of wisdom to grow at least sufficient timber for the construction of fences, buildings, bridges, etc., on the farm and for their upkeep. This calls for more forest acres to supplement that needed for fuel. In fact, one would not be on the safe side in meeting farm demands for forest products on much less than 30 acres per farm.

It needs no argument to convince most farmers that there are more than an average of 30 acres per farm that could be more profitably used for growing trees than anything else. A vast acreage of abandoned, eroded, and waste land can find no profitable use other than growing trees. The problem is to get these lands planted to trees before all the fertility is washed away.

AEROPLANE TIMBER CRUISING IN MISSISSIPPI DELTA

Photographs of forests taken from an elevation of 12,000 feet have proven time and money saving as an adjunct to ground work, according to the Southern Forest Experiment Station, New Orleans.

"If a given mapping job begins with aerial photography, nearly every succeeding step in the preparation of the finished map will be simplified and expedited," according to a statement of the station.

Another statement of the report is "Aerial surveys at a cost of less than two-thirds of a cent per acre show more detail than ground surveys at many times this cost."

Anyone interested may obtain a mimeograph circular entitled "The Use of Aerial Photographs in Mapping Ground Conditions and Cruising Timber in the Mississippi River Bottom Lands" by writing the Southern Forest Experiment Station, New Orleans, La.

FORESTRY QUESTION BOX

Pine needles on my pines have died in unusual numbers during the fall. Is there any disease attacking the trees?

The browning of needles is probably due to the natural shed after two years on the tree, and no disease may be involved. It is true that yellow needles seem more in evidence than usual the past fall, probably to be attributed to a season of prolific production of needles about two years ago.

Pine needles shed throughout the year. They do not turn loose on the dot after two years attachment; nor are all new needles, or leaves, grown in the spring as is the case of broadleaf trees, but they are developed throughout the growing season. This, of course, would tend to extend their period of dropping. Cold weather is not a factor.

What is the best way to store pine seed?

After they have been threshed from cones they should be put in containers and placed where the temperature is fairly uniform and cool. The containers should be rat proof, or else the seed should be stored where rodents cannot get to them. Keep seed away from the rays of the sun. Cellars are usually desirable as storage places. If cellars, or other storage places are quite damp, mold may set up, but on the other hand, a very dry atmosphere is not as good as one with a fair degree of moisture. A dry atmosphere around a stove or furnace will take too much moisture out of the seed.

How far north can the tung oil tree grow?

So far as experience with the varieties now commonly grown in the south has developed, it is considered that their fruiting buds will not stand temperatures much further than 150 miles above the Gulf coast line. Experiments with hardier varieties of north China may reveal that the northern limit may be extended.

Will pines grow faster in south Georgia than in north Georgia?

If soil and moisture conditions were similar, they should grow slightly faster in south Georgia because of a longer growing season in that section. Generally speaking, the soils of north Georgia are on the average a little better for trees, so that the greater length of the growing season of south Georgia may be offset by soil conditions.

The rapid growing slash pine in south Georgia and the loblolly in north Georgia are very close as to rate of growth, surpassing the slower growing longleaf pine of south Georgia and the shortleaf of north Georgia.

VIRGIN TIMBER RESERVES NEEDED IN SOU. STATES

Some steps have been taken to establish "Primitive Areas" and "Natural Areas" in the west, but nothing is being done to establish such areas in the south. Virgin timber areas in this region are all but gone.

Many important lessons are to be learned from virgin forests. The best specimens of timber grew in that environment. Second growth timber growing up on cut-over land is not producing the quality of wood of the natural forest. What makes the difference? How will we know unless there are primitive areas to study and find out?

The virgin forest can be made a useful laboratory, but if something is not done to retain these virgin forest areas, the opportunity will soon be gone beyond recall. They may hold the secret of greater success in forestry.

GORDONIA ALATAMAHA IS NOW PROPAGATED

The Franklinia, later changed to Gordonia Alatomaha, the "lost tree of Georgia", found by John Bartram in the Altamaha river swamps about 1794, is now propagated for garden planting. But for Bartram's specimens carried from Georgia and grown in Philadelphia, this tree species would have been completely lost, for no trace has ever been found of the original stock on the Altamaha.

The present recognized name of the tree given by later botanists changed the title from "Franklinia" to "Gordonia" and added the name "Alatomaha", which at the time was the spelling given the Altamaha river. The original spelling is, however, continued in the official nomenclature of the tree and is now called "Gordonia Alatomaha".

WOOD PRESERVATION TREATMENT APPLIED TO STANDING TREES

Considerable interest has been created by a successful method devised in Switzerland for impregnating trees through sap channels with chemicals that give a preservative treatment costing less than half that of methods usually employed.

Into the base of a living tree sloping holes are bored by augers. Into these holes the preservative chemicals are placed. The sap takes them up and thoroughly impregnates the tree to make the wood resistant to decay and insects, including termites.

The chemical combination is a trade secret, but is said to consist of a mixture of dinitrophenol, sodium fluoride and an arsenic compound. The trees are killed and impregnated with the preservative in two or three days and are ready to harvest and use as poles, posts, crossties, etc.

PINE PULP FOR RAYON GA. TECH'S EXPERIMENT

The experimental laboratories of Georgia Technological School, Atlanta, under the direction of Harry Vaughn, has been carrying on studies of pine pulp for the manufacture of rayon. Recently preliminary results were announced before a group of alumni, indicating that cellulose of pine fibre is suited to making artificial silk known as rayon, and for other common cellulose products. Further work is to be done to develop the full possibilities before the technique employed is published.

Rayon and other widely used cellulose products that have come into use in recent years have depended upon pulp of red spruce of the north.

The adaptation of pine cellulose to various products is also a project on which Dr. Chas. H. Herty, director of the Pulp and Paper Laboratory of Savannah, is engaged along with his studies of making various kinds of paper.

OCTOBER FOREST FIRES SUPPRESSED BY CCC CAMPS

Reports from CCC camps under state supervision in Georgia show there were 813 forest fires in October, with only 865 acres burned over, or slightly more than one acre burned per fire.

This report indicates that the CCC men are getting quick reports of fires and are promptly getting to and suppressing them.

The report shows the causes of fires as follows: Smokers, 143; brush burners, 95; purposely burned, 335; miscellaneous, 240.

FIRE DESTROYS GAME

A bulletin entitled "Georgia's Game and Fish" recently issued by the Georgia Department of Game and Fish, carries a message on game for sport, food, recreation and a money crop to the farmer, and asks the pertinent question, "What are you going to do about it?"

The bulletin makes interesting reading of a plain, practical sort.

Concerning burning the woods, it says, "Don't" and adds, "Fire destroys game and game birds to the value of several million dollars a year, besides the destruction of young timber. Game will not stay where there is no cover."

The State of Washington led in total lumber production in 1933, Oregon second, Louisiana third, Mississippi fourth, California fifth.

The Harvard Medical School announces that it has discovered electricity in the human brain. Maybe that is why some of us have such shocking ideas.—Southern Lumberman.

FIRST DISTRICT

Russell Franklin, Dist. Forester
Rome

Fire Season Begins

Continued early morning frosts and dry weather have marked the beginning of the fall and fire season. The TPO's are increasing their activities and are now beginning to line up their patrolmen and towermen. Smoke from forest fires has been noticed on several occasions. The patrolman for the Gilmer county TPO reports no fires as yet, but that he is looking for things to "hum" any time now.

Fire Towers Planned

Two steel lookout towers are planned for the Gilmer county TPO and work on these is to be started as quickly as the materials arrive. These two towers, with one wooden one already completed, will serve the entire county. Roads to these two tower locations have been surveyed and some construction work done.

School Forests Established

The majority of the new schools in this district have requested a survey of their school forest. It is a pleasure to note the interest shown by all the schools in their forest projects. The FFA of Lafayette high school in cooperation with the Georgia Forest Service put up a good forestry exhibit at the Walker county fair. Mr. J. P. Baker, county agent of Chattooga saw this exhibit and requested this district forester to put up a forestry exhibit at the Chattooga county fair. While putting up this exhibit, it was interesting to note that the exhibit of the fore school contained many interesting forestry specimens. In fact, some of their specimens were borrowed to place in the Walker county fair prior to the fair in Chattooga county.

To Advertise Fort Mountain Park

Citizens of Gilmer and Murray counties are organizing into a Fort Mountain club or association to advertise and further the new state park now under construction on Fort Mountain. The Lions Club of Chattahoochee is taking much interest in this and is sponsoring a program for the purpose of advertising and advancing this work.

Lightning causes more than half the forest fires in the national forests of Oregon and Washington. The danger period is between 10 A. M. and 10 P. M. Needles and snags are the most important kindling materials with snags and trees next.

One-third of the lumber cut in 1933 was from southern pine. Alabama led with 637,499,000 board feet of the total of 4,445,000,000.

SECOND DISTRICT

W. D. Young, Dist. Forester,
Gainesville

North Georgia Tree Nursery

All available nursery stock at both the North Georgia and South Georgia nurseries has been sold. Walnut and Black Locust seedlings are grown at the North Georgia Nursery while pine seedlings are grown at the South Georgia Nursery.

Walnut seed are being purchased and planting will be done before Christmas so that a large supply of these seedlings will be available next planting season. Ordinarily walnut seed take from 1 to 2 years to germinate. It has been found that by planting the seed in the fall most of them will germinate the following spring.

Real Co-operation

The Enotah TPO, and the two counties in which it is located, Union and Towns, have aided the two CCC camps, which were located one in Towns and one at Neel Gap in Union, to the tune of some \$14,000.00 in loans of tractors, graders, rock crushers, personal services, and lumber the largest item.

The camp in Towns has been abandoned but it is hoped that it will be remanned on April 1 provided the CCC work is continued.

School Demands Heavy

Several new vocational teachers have been provided in this district this year and the district forester is having a time trying to get around and make surveys of the new school forests and visit the old ones. The new ones bring the total to 36 in District 2.

Vogel Park Lake to be Stocked With Trout

Construction of the dam at Neel Gap is nearing completion. This dam when finished will impound 33 acres of water, which will add considerably to the state park at this point.

Two rearing pools have been constructed on the creek above the lake and 5,000 rainbow trout have been put in awaiting the time when they will be large enough to loose in the lake for fishing purposes.

The rearing pools are permanent and plans are to secure several thousand fish a year from the state fish hatchery for restocking the lake.

The "Moundville Anthropological Reservation" is being established in Alabama. How can one expect a tourist to inquire the way to it?

Lumber production in 1933 was 14,000,000,000 board feet, an increase of 37½ per cent over the 1932 output the low record since 1869.

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Chattahoochee Valley Exposition Enjoys Successful Forestry Exhibit

A sand table exhibit of large size prepared by the district forester illustrated the advantage of forest fire protection. The entire table was made to represent mountains and valleys. Half of the table, representing protected forests, was made life-like and educational by the presence of miniature log cabins, lookout tower, rustic bridges over streams, roads, etc. Roads were given a "paving" of corn meal which looked very much like a miniature crushed stone road. A green grass effect over the entire area was produced by a generous sprinkling of corn meal in which dry chrome-green kalsomine had previously been mixed. Small cedar branch tips made realistic looking trees. Light blue oil cloth made a very good imitation of a clear, flowing stream.

In contrast to the "protected" area, was the other half of the table representing forest fire damage. A firebreak separated the contrasting burned and unburned areas.

A very desolate and realistic looking "burned" area was produced by a light sprinkling of corn meal on the dark soil base which gave the appearance of ashes following a forest fire. This was made more realistic by a liberal distribution of charred stumps, fallen trees, etc., prepared by partially burning small pieces of wood. The valleys of course were dry in this area as compared to the clear, running streams on the "protected" area separated by the firebreak.

The whole exhibit was surrounded by a rustic framing made from pine poles and was given background by pine boughs. Several hundred leaflets were distributed, and suitable posters were displayed.

Marguerite Garden Club of Columbus Sponsors Conservation Meeting

November, the month set aside by the garden clubs of Georgia as "Conservation" month was the occasion for a meeting by the Marguerite Garden Club devoted to this subject.

There are thirteen garden clubs in Columbus with a membership devoted to worthwhile causes. Needless to say, the subject of the conservation of our natural resources, particularly our forests and the many things that go to make up a forest besides trees, is a subject dear to the hearts of the garden clubs.

The Marguerite Garden Club, with Mrs. Lawrence Murray as President, together with the invited guests of twelve other garden clubs was in attendance and heard a talk on the subject of "Conservation and

Recreation" given by the district forester. Following this the meeting was given over to a round-table discussion of the manner in which the garden clubs of Columbus could give active support to conservation and recreation movements in Georgia.

Pine Seed

SP-7, Warm Springs, and P-78, Butler, overfulfilled the quota of pine cones for the Fourth District by several hundred bushels. Incomplete reports from SP-7 point to more than 100 bushels of loblolly pine cones, the quota for that camp. P-78, not having a quota at all, but always anxious to do its share, gathered about 50 bushels of loblolly, and approximately 500 bushels of longleaf pine cones at a total labor cost of 115 man days. It looks to me like the Georgia Forest Service now has more pine seed "Than Carter had oats". At least that is the way the caretaker at P-78 feels about it since he has the job of cleaning all the seed at that camp.

Gordon Institute to Teach Vocational Forestry

The popular military school at Barnesville, Gordon Institute, has taken over the buildings formerly occupied by the Barnesville Georgia Industrial College where Mr. Felix B. White made such a good record in the teaching of vocational forestry and agriculture. Mr. C. W. Mobley, the present vocational teacher at Gordon Institute, appears to have the ambition to do just what Mr. White accomplished while at Barnesville. This school has an exceptionally good school forest, and, to make things more interesting, they have on this forest a first class log cabin furnished top notch. The school plans a well rounded program of forestry activity this school year which will be observed with keen interest.

Term "Weed Tree" Undesirable

The word "weed" applied to less desirable trees is unfortunate, according to the Quarterly Journal of Forestry, which says: "The modern ecological view that a wood is a complex system in which the trees, shrubs, ground vegetation and the soil fauna and flora combine to preserve a healthy and stable condition leaves very little use for the word 'weed'".

Rubber Foresters

"Rubber Foresters" is the title of an article in the October issue of the Journal of Forestry, by J. S. Barnes who has had experience in Sumatra, in which he writes interestingly of work in rubber plantations operated by tire manufacturers of this country. Young men of good constitution and adaptability to living conditions of the tropics, preferably unmarried, are recommended for this interesting field of forestry work.

SIXTH DISTRICT

Jack Thurmond, Dist. Forester
Savannah

Liberty T. P. O.

The Liberty County T. P. O. at a recent meeting voted to purchase a Hester, two-way, fire break plow to use in the construction of secondary fire breaks. The Liberty T. P. O. has also provided for the purchase of three wall type telephones for use in the reporting of forest fires. The phones are to be placed at points where the fire hazard is greatest.

At the same meeting new officers were elected and instructions given to the Secretary-Treasurer to hire and direct the work of the lookouts and patrolmen. The T. P. O. will hire two lookouts and one patrolman for the present fire season.

Ogeechee T. P. O.

Mr. Elliott Reed, Secretary-Treasurer of the Ogeechee T. P. O. of Chatham county, will purchase signs for distribution over the lands in the T. P. O. calling to attention of the public that the land behind the signs is under protection. This will let the public know that no fire should be set on the land.

Long T. P. O.

At a recent meeting of the Long T. P. O. the budget for this fiscal year was adopted and plans perfected for hiring a lookout and patrolman.

Plans were also formulated for the co-operative maintenance of several miles of primary fire breaks which will need reworking in the early spring. Another meeting is to be called later in the month.

The same officers of the T. P. O. were retained for another year. T. L. Howard, President and J. E. Parker, Secretary-Treasurer.

E. C. W. Notes

Mr. David Dorward, of the Regional office, inspected all the work at all six of the camps in the Savannah district, during the past week. All types of work including truck trails, fire break construction, telephone line, tower erection and seed cleaning was inspected. T. P. O. activities related to E. C. W. work were also gone into and plans for maintaining improvements put in by E. C. W. were discussed.

Mr. Dorward proceeded to Waycross Sunday, November 18th, after looking over forest work on Blythe Island, near Brunswick.

We have on hand in the Savannah district office over 1,100 pounds of Slash Pine seed and 200 pounds of Loblolly seed. About 400 pounds of Longleaf seed will be cleaned and ready in a few more days. The cones from which the seed were extracted were gathered by the camps in the district and

stored for drying in a tobacco warehouse in Vidalia.

The seed was thoroughly cleaned by Camp P-82 Reidsville. They designed a cleaning machine that not only separated the wings and foreign matter from the seed from the good ones. The seed will be used at the state tree nursery at Albany.

SEVENTH DISTRICT

C. Bernard Beale, Dist. Forester
Waycross

T. P. O. Secretaries Meet

A conference of all permanent secretaries of the TPO's in District 7 was held at the district office, Waycross, on Saturday, November 10. Problems relating to the operation of the detection systems, organization of community fire suppression groups, individual pre-suppression activities of TPO members, methods and means of secondary firebreak construction and maintenance, dissemination of authoritative information on various phases of protection, obtaining proper financial support of T. P. O. Members, and the keeping and filing of records and reports were discussed. It was unanimously agreed that legislation toward the enactment of a more adequate State fire law and a fence law would be necessary before much headway can be made in controlling and properly prosecuting cases of incendiarism.

The following secretaries were present: S. N. Smith, Brantley TPO, Nahunta; J. M. DuPuis, Appling TPO, Baxley; L. F. Morey, Coffee-Jeff Davis TPO, Douglas; J. O. Rodgers, Consolidated TPO, Homerville; P. B. Copeland, Hurricane Creek TPO, Alma; W. M. Oettmire, Suwanee TPO, Fargo.

Appling T. P. O. Barbecue Attended by Hundreds

At a barbecue given by members of the Appling TPO at Baxley on October 25, approximately 2,000 timberland owners, farmers, business men, children and C. C. C. workers attended. A speaking program was conducted all day, with L. C. Walker, county agent and "Father of the Appling TPO" as chairman. In the morning, speeches were made by W. L. Veal, TPO President; the C. C. C. Chaplain; the C. C. C. Education Advisor, Mr. Durden; the Camp Commander of P-62; the Camp Superintendent, H. Brown, and Camp Superintendent of P-68 R. E. Tittle.

In the afternoon, speeches were made by H. M. Sebring, Assistant State Forester, Atlanta, Congressman Braswell Deen of this Congressional District, and C. B. Beale, District Forester. The barbecue consisted of pork, beef, kid and fish, with of course the stew, slaw, etc. A committee headed by E. E. Miles, prominent landowner and TPO member, was in charge of the arrangements. Members of the CCC, P-62, assisted.

(Continued on Page 8)

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE GOLD DEPOSITS OF GEORGIA

By Roy A. Wilson

(Published by permission of the Director,
United States Geological Survey)

ARTICLE 3—GEOLOGIC FEATURES

It is probable that every part of Georgia which has shown surface indications of gold has been prospected during the last 100 years. Pits, trenches, old tunnels and shafts, open cuts, and abandoned placers are found in all the areas showing mineralization. It is doubtful if any large area exists that can be regarded as virgin territory for prospecting. Parts of the gold belt where there is no such evidence of past prospecting were for some reason passed over as unfavorable. Exceptions to this would be lands owned by individuals or families who have not permitted prospecting on their property by outsiders.

of production largely lie. The recent surveys have therefore been largely confined to such areas.

Except for minor variations, the geologic features of Lumpkin county as related to the mineralization are characteristic of the gold belt as a whole, and the following discussion is based upon detailed studies in that county.

The productive areas of this county contain narrow, elongated lodes, trending northeast. The structure of the enclosing formations has controlled to a notable degree the development and mineralization of the gold-bearing lodes. It is believed that an understanding of these structural features will materially aid in prospecting and developing the ore bodies, and for this reason they have been studied in some detail.

Contrary to common belief, the individual lodes do not extend for long distances. They average a few thousand feet or so in length and show local variations in width from several feet to 100 feet. Greater widths

belt several lodes may be developed parallel to one another. They lie either roughly parallel to the belt or—as on Findley Ridge, for example—at an angle to the belt. The position of the lodes is as a rule closely related to the cleavage, grain, or schistosity of the enclosing rock. Exceptions occur, but commonly the lodes trend northeast and dip or slope southeast with the cleavage of the formations.

These lodes are termed “veins” by the prospectors and miners, but the true veins consist of the many small irregular-shaped masses and lenses of quartz that lie within the lodes. The typical veins range from an inch to several feet in thickness and from a few feet to several hundred feet in length. They swell and pinch abruptly. Commonly, the veins are in the form of small stringers of quartz which lie parallel to the cleavage or schistosity of the enclosing rock. The veins are largely the result of a replacement of the country rock which forms part of the lode. The country rock is composed of schist or granite and is in general intricately mixed with the vein material. The mineralization has generally been confined to the veins, but it may have penetrated the altered country rock that forms part of the lode.

The gold is irregularly distributed through the vein material, barren masses of quartz and the enclosing rock occurring along with those that carry gold. Commonly, the higher tenor tends to be concentrated in localized ore bodies, which vary in shape according to the local structural features of the rock. The deep-lying granitic intrusions, now well exposed over the region, probably formed the source of the mineralizing solutions, which found a more ready passage where such features as rolls in the schistosity, shear planes, joint planes or fissures, or more open cleavage were present.

Technical details relative to the mineralization will be considered more fully in a forthcoming report by the United States Geological Survey. The point emphasized here is that in the area of mineralization the structural features are significant. As an illustration of this point, it is common knowledge among the miners doing underground work in the gold belt that in many places the ore forms shoots or chimneys in the lodes. These ore shoots are in the form of ellipsoidal masses that average a few feet in cross section and rarely exceed 100 feet in length. They generally plunge or “rake” at fairly steep angles within the lode and to the northeast. The data in hand show that “rolls” (waves) in the schistose cleavage of the country rock have determined the formation of such ore bodies.

The reader can obtain a mental picture of this structural arrangement of an ore shoot by comparing the lode with its many small, irregular veins to a house roof sloping southeast. If the roof had large corrugations running at an angle down the slope and to the northeast, these corrugations would represent the rolls in the schis-

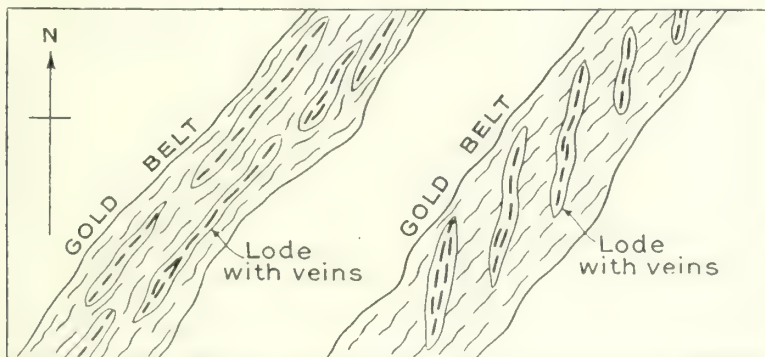


Figure 4. Sketch map showing relation of lodes of gold belt.

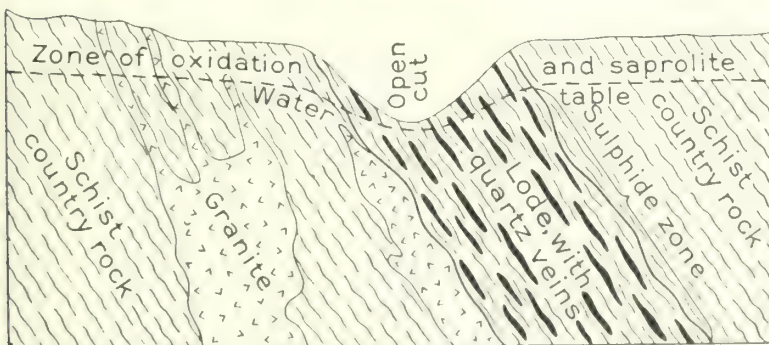


Figure 5. Idealized cross section showing character of lode and its relation to country rock

Certain parts of the gold belt have been favored by extensive and locally intense mineralization. It is in these areas that most of the mining has been done and that present activities and future possibilities

are exceptional. Some of the lodes lie end to end, with barren areas between, and this arrangement probably explains the local belief that the lodes extend for many miles without a break. At any point in the gold

tosity. The ore shoots lie with their long axes roughly parallel to these rolls or corrugations and at points along the length of the lode where structural conditions have been more favorable for the localization of gold deposition. Quartz stringers may be equally well developed between these ore shoots but show much less mineralization. Other forms of ore bodies occur, but this type seems especially characteristic of the Georgia gold belt.

The present surveys indicate that the above-outlined features of geology and mineralization are in general typical of the entire Georgia gold belt. In different portions of the belt there are peculiar local features, some of which will be briefly mentioned later in descriptions of the active properties.

NEW DEPOSITS BLEACHING CLAY DISCOVERED IN GA.

An investigation of the bleaching clay deposits of Georgia, including the fullers earths of Southwest Georgia, certain clays of Middle Georgia, and the bentonites of Northwest Georgia, has just been completed by the U. S. Geological Survey in cooperation with the Georgia Department of Forestry and Geological Development, according to State Geologist Richard W. Smith. The investigation was conducted by Dr. Harry Bay, assigned by U. S. Geological Survey, and financed by a direct grant from the Public Works Administration.

Fullers earth has long been mined in Decatur County for use in refining petroleum oils. Mr. Smith states that Dr. Bay collected samples for testing from deposits in Grady and Thomas counties that appear to be of a similar grade, and in addition prospected promising deposits in Crisp County. Extensions were also found of the deposits of bleaching clay south and east of Macon that are used in clarifying vegetable oils.

Dr. Bay's tests of the bentonite deposits of Walker and Dade counties in Northwest Georgia indicate that they have some possibilities as a bleaching clay if mining costs can be kept low enough. The complete report of Dr. Bay, including the laboratory tests on his samples, will later be published by the U. S. Geological Survey.

A new use for Georgia's bleaching clays is indicated, Mr. Smith states, as a result of experiments now being conducted by several Georgia city water works on the possibility of substituting the Georgia clay for activated carbon now used to remove organic odors from water.

State Forest Research

"The State should carry on the research necessary, both in forest products and silviculture, giving the forest owner the basic information for forest management in the same way in which it undertakes agricultural research, and including demonstration forests which act as educational guides to private owners."—P. Z. Caverhill, *Journal of Forestry*.

GA. SOCIETY FOR ARCHAEOLOGY HOLDS MEETING IN MACON

The Georgia Society for Archaeology held its third meeting at the Dempsey Hotel, Macon, on Friday, November 16th. The banquet of the Society was preceeded by a business meeting at which the following officers were elected: Dr. C. C. Harrold, Macon, President; J. M. Mallory, Savannah, 1st Vice President; Mrs. M. E. Judd, Dalton, 2nd Vice President; Richard W. Smith, Atlanta, Secretary-Treasurer; W. A. Harris, Macon; Dr. A. V. Henry, Atlanta; Hon. Ogden Persons, Forsyth, and R. R. Otis, Atlanta, members of the Executive Committee.

Dr. J. R. Swanton, of the Bureau of Ethnology of the Smithsonian Institute, Washington, D. C.; Dr. Frank M. Setzler, of the U. S. National Museum, Washington, D. C., and Dr. Walter B. Jones, State Geologist of Alabama and Director of the Alabama State Museum, Tuscaloosa, Alabama, were guests of honor at the banquet at which Dr. C. C. Harrold was toastmaster.

Following the banquet was an illustrated lecture by Dr. Setzler on "First Families of Georgia, their Ancestors and Their Antiquities." Dr. Setzler stated that in his opinion the Indian mounds and village sites in Georgia will be found to contain the clue to the wanderings of the various tribes that were the ancestors of Indians found in the Southeast by the first white settlers. Studies of pottery and ornaments found in excavating the Indian mounds along the Mississippi and Ohio rivers, he said, have shown that they can be divided into several groups or cultures of varying antiquity according to their designs. Several of these types have been found in Georgia.

Dr. Swanton and Dr. Setzler, together with several members of the Society, spent the week following the meeting visiting known Indian localities in Georgia searching for clues to other cultures.

Appling T. P. O. Barbecue Attended by Hundreds

(Continued from Page 6)

ed in cooking and serving. The speeches were varied, describing the religious and educational life of the CCC camp; the responsibility of camp authorities; the work of the CCC camps in building up a fire protection system; the activities of the TPO and need for response from a greater number of members in doing protection work and rendering financial support to the TPO's cooperative program; the economic value and importance of forests and the necessity for better fire protection. Practically all speakers emphasized the need of effective fire control in order to have forests properly reproducing and growing. Several TPO members testified as to their success and value in keeping the woods "rough" and pointed out that only by keeping the woods rough can we continue to

have timber for future consumption.

CCC Items

W. W. Garwood, foreman P-59, Fargo, is installing lighting protection facilities to eleven steel and six wooden towers in the District.

Camp P-84, formerly at Waycross, was safely moved to Homeland, near Folkston.

Camp P-65, Jesup, has a fire whistle all rigged up that can be heard all over Jesup.

Camp P-62, Baxley, did a noble job in handling the Appling TPO barbecue in October.

Camp P-68, Douglas, recently held a carnival put on by Educational Director Durden. It is understood there was plenty of frolicking done.

Camp P-60, Woodbine, is having plenty of fun with the palmettos along the coast. They have a root on exhibit grubbed along a break measuring 6 in. in diameter; length indeterminate.

Camp P-59, Fargo, is gradually "digging" its way toward Tarver, the western boundary.

Camp P-52, Homerville, is being kept on the run helping out with fire fighting.

Camp P-70, Nahunta, does everything in a big way. Seven miles of break burned in a day by a 50-man crew.

T. P. O. News

S. N. Smith, formerly ECW foreman at P-60, was appointed secretary of the Brantley TPO, by the board of directors on Nov. 6. Mr. Smith succeeds J. H. Warren. The Brantley TPO is operating two towers and is having six fire trailers built, one to be placed in each community. A cooperative patrol is being maintained on about 50,000 acres.

J. M. Du Puis, Secretary of the Appling TPO at Baxley, reports that all four towers are now manned and fires in any part of Appling county can be spotted promptly and precisely.

The Camden TPO has five towers in operation.

The Suwanee TPO in Southern Clinch and Echols counties, has its radio fire dispatch system working nicely. Several patrol cars are in use on the area.

The Consolidated TPO has several towers manned and all were to be placed in operation by December 1. Schools in four counties have been visited and talks made on fire protection by the Secretary, J. O. Rodgers.

P. B. Copeland, Secretary of the Hurricane Creek TPO, with headquarters at Alma, reports many members are plowing secondary firebreaks.

The Charlton TPO has one tower in operation and two more being constructed.

Several members of the Wayne TPO are now constructing secondary firebreaks.

The Coffee-Jeff Davis TPO firebreak plot is being kept busy, reports L. F. More, secretary.

Louisiana led in hardwood production in 1933, with Arkansas second and Mississippi third.

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No. 1

FEDERAL LAND ACQUISITION POLICIES PROTESTED BY GOVERNOR TALMADGE

Lack of Consideration for the Rights of the State Charged—Government Competition with Private Timberland Owners on Unfair Basis Claimed—State Forester and Private Timberland Owners Also Adverse to Government Purchase Plans.

The January issue of *The Forestry News Digest*, published by the American Tree Association, carries protests of Governor Eugene Talmadge, State Forester B. M. Lufburrow, T. G. Woolford, President of the Georgia Forestry Association, Alex K. Sessoms and James Fowler, timberland owners, against federal acquisition of forests for commercial development. Unfair competition with private timberland owners, it is claimed, will result from the federal government's tax-free use of subsidized lands. The statement of T. G. Woolford appeared in full in the December issue of this publication. The statement of Governor Eugene Talmadge is as follows:

Governor Talmadge's Position

"The Federal Government, according to reports, is optioning large areas of land in Georgia for purchase, the area reaching into hundreds of thousands of acres. If any of the agencies of the state are consulted about much of this federal land acquisition program, it is not known to me.

"From such information as drifts in, it seems that options are being taken on sub-marginal lands, largely forest land and abandoned farms that are now in condition to use only for growing trees.

"If this land goes to Federal Government ownership, it is removed from state taxation, removed without the state being consulted.

"I certainly do not want land owners of Georgia to have to compete with the Federal Government in growing timber or in producing naval stores, with the Federal Government using tax-free and subsidized land and not obliged to make a profit.

"Georgia has been getting a lot of wealth from its forests and it looks like a lot more is coming from our woods. Georgians, and not the Federal Government, should get it.

"It seems to me that the Federal Government should at least coordinate its land

purchase activities with some consideration for the rights of the state."

State Forester B. M. Lufburrow's Views

"It is the general opinion of timberland owners, forestry leaders, naval stores operators and lumbermen of Georgia that the commercial development of forest resources should be left to private interests.

"The chief reason given for this position is that private timberland owners are placed at a disadvantage when forced to compete with the federal government, because the private owner has taxes and interest on his capital investment to meet, whereas the federal government operates on tax-free land and has the use of unlimited capital on which it is not compelled to pay interest nor make a profit.

"Georgia has several large units of privately owned land where good forestry practices are carried on. In spite of handicaps, private forestry in Georgia is making progress and only by making conditions as favorable as possible to the private timberland owners is there any hope for the full development of the state's forest resources. Establishing national forests that would be competitors of the private land owners would, of course, discourage private initiative.

"The help needed most for private forestry is a guarantee of fair tax rate to replace the present tax burden.

"With these obstacles removed and with both federal and state aid adequate to the need, private forestry will succeed and a maximum number of people will find employment in forests and wood working plants."

Alex K. Sessoms, Cogdell, Large Timber Owner, Opposes Plan

"I am very strongly opposed to the policy of the federal government buying lands in our state. My reason for this opposition is:

"Private enterprise in our section can, will and is doing a better job at reforestation and protection than the federal government is doing under similar conditions.

"Private enterprises are practicing reforestation and making it not only self sustaining, but a profitable business venture.

"Lands owned by the federal government are not subject to taxation, and if large tracts were owned by the government, the remaining land would have to bear the tax burden now borne by the whole area.

"I further oppose it for the reason that I believe the government should not engage in business, and there certainly is no emergency existing in our section that requires the government purchasing large land holdings for any purpose."

Hon. James A. Fowler, Soperton, Large Land Owner and Forester, Expresses Views

James Fowler, Soperton, a large individual land owner in Treutlen county, pioneer in large-scale planting of slash pine, naval stores operator and member of the state legislature, says:

"As a timberland owner in south Georgia, depending largely on pines for an income, I do not look with favor on federal purchase of timberland to use for commercial development. I do not want to be placed in a position of having to compete with the federal government which has the advantage of using tax-free land, unlimited capital for managing the forests, and is not compelled, as private owners are, to make a profit.

"I appreciate the assistance received from federal sources through the Clarke-McNary Law and Emergency Conservation Work. This aid has given encouragement to private land owners and helps us to carry on in this long run proposition of growing a crop of timber.

"Assistance to private land owners, I think, is better than putting the federal government into the business of large scale timber growing for commercial purposes.

"I have put my faith in timber growing. I took the land out of cultivation and planted to slash pine nine years ago, have continued to plant year by year and have cared for areas that have come back through natural reproduction. Nothing has caused me to doubt the successful outcome of the undertaking except the entrance of Uncle Sam into the field as a competitor, with all the advantages on his side.

"I think that any private timberland owner in the naval stores belt would be foolish to sell to the federal government with forestry possibilities this section has and which it seems certain will be increased through paper manufacture.

"It has been my privilege to show that slash pine grown in a plantation only seven years is large enough to make pulpwood for the paper mill, and thinnings five to

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eight inches in diameter were taken out for this purpose. Pine land owners will find in this experience a reason why they should not part with their lands to the government.

"I hope the federal government will make it a policy to help the private timberland owner and never to hinder him."

Refrain from Hunting Near CCC Camps

Robert Fechner, Director of ECW, has asked that all hunters refrain from hunting within rifle range of any work project of the CCC camps. Request for cooperation of game wardens or conservation commissions for this protection has received splendid response, according to Mr. Fechner.

In a number of states signs have been posted, warning hunters that CCC men are at work in the area.

FOREST FIRE REPORTS IN REGIONS CCC CAMPS

The November report of forest fires in regions served by CCC men show 82 fires with a total of 6,338 acres burned over in Georgia.

The fires classified as to causes are: railroads, 5; campers, 2; smokers, 3; brush burners, 8; purposely burned, 43; lumbering, 1; range burning, 1; miscellaneous, 19. Thirty of the fires were under 10 acres burned over.

The estimated damage done by the fires is \$9,313.92.

In the vicinity of castor oil plants grown every ten feet apart in the tree nursery beds at Mont Alta, Pennsylvania, no grubs were found in the soil.

PINE PULP RAYON AN ACCOMPLISHED FACT

Dr. Herty and Aids Produce Pulp That Meets Requirements of Manufacturers — Greater Tensile Strength Shown

Rayon has been made from pine pulp prepared by Dr. Charles H. Herty and his scientists at the Savannah Pulp and Paper Laboratory.

"Highly satisfactory" is the way a rayon mill reported to Dr. Herty on its trial run of pine pulp. Another says, "It compares favorably with the best pulp we are using."

The paper pulp now in general use for making rayon comes from red spruce, much of it from abroad.

With all the pine available in the south, with its pulp not only good for making rayon, but for making white paper, brown wrapping paper and cardboard, the outlook for pine fibre is improving.

Dr. Herty says, "There was great delight manifested at the pulp laboratory here when it was found that the tensile strength of the rayon yarn from pine pulp was 1.6, when the customary strength is from 1.5 to 1.55.

The cost figures for unbleached sulphite pulp according to AAA standards is placed by Dr. Herty at \$44 per ton and bleached at \$70 per ton, which he states is much lower than the cost of pulp made from red spruce.

Royal H. Rasch, expert cellulose chemist, has been at work on the problem of pine cellulose at Savannah since March 1934, and has been aided by Randolph Richter and Frank McCall of the pulp and paper laboratory.

Fire Losses Southern States

According to information released by the U. S. Forest Service, the losses from forest fires in 1933, in southern states suffering most were Florida, \$19,800,000; Georgia and Mississippi, \$5,000,000 to \$7,000,000; North Carolina, \$3,000,000.

In a majority of southern states the loss was less than for the preceding year.

CCC Men Find Outside Employment

Robert Fechner, Director of Emergency Conservation Work, reports that up to October 1, 110,000 of the 300,000 original enrollees have been able to find outside employment. This information has been obtained by canvassing the men who left camp during their period of enrolment, or after they had served out their time in camp.

According to a statement issued by the U. S. Forest Service there are 149,945,725 acres classed as farm woodlands, of which 85,321,900 acres are pastured. The value of timber products harvested from these wood lots in 1929 was \$242,042,245.

REFORESTATION ESSENTIAL TO GUARANTEE WOOD PULP

Paper Industries Looking to South Must Visualize Future as Well as Present Supplies — Idle Lands Must Be Put to Tree Growing

While preliminary reports of the federal forest survey in the deep south opens to view enough available pulpwood to meet the nation's paper demand for several years, that in itself is not enough. Of great concern is the prospect of sustained pulpwood yields. How much pulpwood will there be 15, 20, 25 years from now?

An impressive quantity will be made certain only by reforesting areas not used for other purposes, of which there are millions of acres in Georgia alone; also by keeping fires out of the woods.

Lands swept annually by fires have not had a chance to undergo natural reforestation and a great deal of forest land in Georgia is not as well stocked with saplings as it should be to guarantee a future pulpwood supply, because occasional fires are allowed to kill off young growth.

The far sighted land owner who wants to share in the future demand for pulpwood should be taking care of his woodlands and should be planting trees on his open areas and in open spaces in forests. A program of annual planting of trees will insure an annual crop of pulpwood in the future.

The success of forestry in Europe for hundreds of years has been the result of planting immediately following a cutting, and of harvesting in one year no more than the forest has grown that year.

Perhaps it is too much to expect a close and meticulous following of such rules in this country. But it is reasonable to expect planting every few years so that a harvest of pulpwood may be obtained every few years.

If the south is to lay claim to the paper industry, as it well can with its rapid growing pines and many acres of idle, low cost lands useful only for growing trees, it must plant and continue to plant, protect and continue to protect, and it must not delay the beginning. There must be a large supply of pulpwood assured for years to come, which involves definite planning for sustained yields. Present haphazard methods must be abandoned once for all.

If there ever existed anything approaching "easy money" for land owner, it is in growing trees for which there is a promising market. Not "big money," but money from land which is yielding nothing but taxes—tree money made with little outlay of cash and labor. It really costs very little to grow from one to two cords annually on an acre of land.

The City of Amsterdam is built on 4,000,000 piles obtained from the fir forests of Germany, Russia and Norway.

ABUNDANT PULP WOOD IN SOUTHEAST GEORGIA

Forest Survey Shows 44,966,000 Cords Pulp Wood in 35 Counties, of Which 26,357,000 Cords Could Now be Cut Without Taking a Tree Being Turpented

Advance information released by the Southern Forest Survey Staff of the U. S. Forest Service, covering 35 counties in southeast Georgia, indicates that there are 29,703,000 cords of pine pulpwood available in the territory. This area is also the heart of the naval stores belt and produces 50 per cent of the country's output of turpentine and rosin.

The report sets at rest any doubt that has existed about the supply of pulpwood in the pine belt of the south being adequate for the paper demands of the country.

In addition to the 29,703,000 cords of pine pulpwood, the survey reveals 15,263,000 cords of pulping hardwoods such as gum, maple, bay, magnolia, making a total of 44,966,000 cords of pulpwood in the region. Further, there are 9,404,000 cords of non-pulping hardwood such as cypress, oak, hickory, ash, etc.

Pine trees not yet chipped, and those now being worked are, of course, not to be considered actually available at this time for pulpwood. Eliminating these from calculation until they are abandoned for turpentering, the report shows 2,404,000 cords of worked out turpentine pines, 8,690,000 cords of non-turpentine pines, or a total of 11,094,000 cords of pine available. This total will be increased each year as the turpentine trees are taken out of production.

The present available pines, excluding unworked and working turpentine pines, plus the pulping hardwoods (15,263,000 cords) makes the total available cords that could be harvested today 26,357,000 cords in the 35 southeastern counties of Georgia.

Of this amount, trees 6, 8, 10 and 12 inches in diameter comprise 13,114,000 cords. In these diameter classes little competition is to be expected from the lumber industry.

Diameter measurements referred to are taken 10 feet from the ground in the case of worked out turpentine trees and 4½ feet from the ground in the case of non-turpentine pines and all hardwoods.

The percentage of various diameter classes, by average acre and percentage of the total in each diameter class, are given as follows:

- 6 to 8 inches, 2.13 cords per acre;
- 10 to 12 inches, 2.55 cords per acre;
- 14 to 18 inches, 2.03 cords per acre;
- 20 inches and over, 7.79 cords per acre;
- 6 to 8 inches, 27.3 per cent total per acre;
- 10 to 12 inches, 32.7 per cent total per acre;

14 to 18 inches, 26.1 per cent total per acre;

20 inches and over, 13.9 per cent total per acre.

Those who want the complete preliminary report should write Capt. I. F. Eldredge, Southern Forest Experiment Station, New Orleans, La.

PLANNED USE OF FORESTS OUTLINED BY CHIEF FORESTER

Included in Chief Forester Silcox's planned use of land, he estimates rehabilitation work on private forest lands would require 100 million man days per year, or 200 days work a year for half a million men, not including present forest workers.

His legislative program as announced in his address in St. Louis October 24, includes relief employment; conversion of forest products; financing with low interest-bearing bonds; soil erosion and flood control; additional cooperation with states and other agencies in protection from fire, insects and tree diseases; extension of cooperation and public regulation to private forest holdings for promoting protection and sustained yields; encouragement to reforestation through wider distribution of forest trees and seeds at moderate cost.

New CCC Enrollment For 60,000 Unemployed

Approximately 60,000 new men will be enrolled during the first thirteen days of January, 1935, to bring the force up to 350,000, the authorized maximum, according to a statement of Robert Fechner, Director of the Emergency Conservation Work.

Those desiring to enroll should make applications through their county relief agencies.

FORESTS ELIGIBLE FOR LAND BANK LOANS

A ruling now makes forest lands eligible for loans from land banks on the same terms and at the same rate of interest allowed for farming lands.

Consideration is also being given to making turpentine operations eligible for loans. Fire hazards are involved and a plan to provide insurance coverage as a condition of a loan, is being considered.

Improvement of Nut Trees

An effort to improve nut trees, such as walnuts, various hickories, chestnuts, filberts, is being undertaken by the U. S. Department of Agriculture, starting with the Bixby Plantation on Long Island, N. Y.

Scions from the best nut trees are to go to state experiment stations for further trials. Those that finally do best will be put into regular commercial channels.

FOREST FIRES INFLUENCE ON INSECT ENEMIES

One of the excuses offered for burning off the forest floor is to control injurious insects, such as the cotton boll weevil. Though it has been repeatedly shown that fires do not control this insect, there are some who still burn off their woods for this purpose.

The use of fire to exterminate some other insects has also been shown to be equally useless. Even should there be some kinds of insects that burning the woods will destroy, the damage may be considerably more to the forest than to the insects.

One of the effects of forest fire is to increase the abundance of some insects injurious to trees. For instance, the southern pine beetle, a borer that kills pines by girdling the trunk under the bark, does its greatest damage to weakened trees. It is well known that fires weaken trees, particularly by scorching the cambium, vital layer under the bark. When the trees are thus weakened, the southern pine beetle borer finds its opportunity, but as long as the tree is healthy it will usually strangle the borer with gum and with rapidly growing tissue.

Another and important influence of fire is that it kills some of the insects that are parasites of the insects harmful to trees. Fires also drive out birds and mice. Birds feed on insects injurious to trees, and mice, skunks and other ground feeders eat insects in their worm stage. Even a temporary absence of insect predators may allow some of the injurious borers to gain destructive headway.

Fire upsets nature's way of providing enemies for every insect harmful to the tree. It also brings on an unbalanced condition of forest life under which trees are unable to hold their own in meeting their adversaries.

In a word, forest fires disturb the provisions that nature has made for insect control and in this particular, as well as in others, fires violate fundamental laws of tree life.

The United States Biological Survey is purchasing land along the Savannah river in Chatham county as a game refuge. About 5,100 acres are being added to a refuge that hitherto has been limited to an area in South Carolina.

Definite proof that the smaller European elm bark beetle is a carrier of the dreaded Dutch Elm disease is announced by entomologists of the U. S. Department of Agriculture. What other insects are carriers remains to be determined.

The U. S. Forest Service reports that about 20.79 per cent of the unprotected forest land in the United States was burned over in 1933, but the toll on protected land was only 1.09 per cent.

FORESTRY QUESTION BOX

How much does chipping of pines for turpentine slow down the growth of the trees?

If properly chipped, the rate of growth should not be reduced more than one-third to one-half. The growth rate is generally reduced in proportion to the amount of bark removed from the circumference of the trunk. Chipping prevents sap flow or movement of growth material, leaving the remainder of the undisturbed surface covers of the tree trunk to handle the material which, of course, it cannot do as fully as was done before chipping.

Why are one-year old seedlings recommended for planting in Georgia in preference to two-year old?

It is well proven by experience in this and foreign countries that the small planting stock makes better trees than large planting stock. The percentage of survival is greater with one-year seedlings. In addition, the cost of transplanting is less with small stock, requiring as they do less dirt removal and replacement in planting. It is also easier to preserve the root system of small seedlings than of large ones which contributes to larger survival of planted stock.

Would black walnut from north of the place to be planted do better than walnuts grown locally, or obtained from further south?

It is considered by nut specialists that seed should be obtained from the region where they are to grow. If one were to plant seed obtained north of the point where they are to grow, they would probably do much better than seed obtained south of that point.

Under the Clarke-McNary law, whereby timber owners are compensated in part by the federal government, for expenditures on fire control, is any of this paid for fighting fires?

No. The federal government aids only in fire protection measures such as constructing firebreaks, lookout towers, telephone lines, fire fighting equipment and patrolmen. The expense of suppressing fire is borne by the timberland owner. The fire protection measures aid in controlling fires, and to that extent lessen the cost of fire fighting.

"Every four years enough newsprint is made for a strip as wide as a daily paper and long enough to reach the sun and back," says "Forest Service" (Pa.). It may be added that the south can grow pines to take care of a great part of that indefinitely.

HOLDING RAINFALL AND HOLDING SOIL IN PLACE

Reforestation Necessary Part in Erosion Control, Flood Control and Water Conservation—Ab- sorption of Forest Soils

Much is being said and much is being done about terracing cultivated lands to hold the soil in place. Too little attention is being given to erosion control on abandoned and gullying farm lands. On such lands the worst type of erosion is in progress. The damage is not confined to the land being washed away. Far greater damage is caused to other and better lands below, where the sand and gravel, pouring from the gullies, covers fertile lands and makes them less fertile. Furthermore, this material fills up stream beds; causes destructive overflows, and the sand and gravel carried in the floods, scour away the rich bottom soils. The filling up of stream beds and scouring away of bottom lands by sand and gravel often convert bottom lands into swamps.

The practical way to stop this very destructive type of erosion is to make check dams in the gullies, and plant soil-binding vegetation, preferably trees, for only tree growth is likely to hold the gullying soil, and while doing so produce a revenue and restore the land to agricultural use for the future.

Holding rainfall in place is performed by forest growth better and cheaper than by any means that can be employed. This is true because forest soil has greater ability for absorbing rainfall than cropped or pastured land, even when such lands are properly terraced.

Forest soils are much more porous than cropped or pastured soils, and for this reason, forests account for the greater portion of the flow of springs and wells. In fact, there is very little surface run-off of rainfall from forested land. The absorbed water the trees do not use percolates down into the soil.

The absorptive power of fresh soils can be reduced by fire and heavy grazing. Fire burns the sponge formed by decaying leaves and destroys the check dams that undecayed leaves and fallen twigs form. Both serve to hold rainfall in place. On burned over forest land, the pores of the soil are silted up by the surface wash so that it cannot absorb water as readily. Fire is, therefore, a serious hindrance to forest soil water absorption.

Heavy grazing of forest land or pasture land, with soil compacted by the feet of animals, also creates an obstacle to water absorption. Some interesting data showing the ability of forest soils to absorb moisture comes from the Central States Forest Experiment Station and is reported by Jno. T. Auten, who says: "In many regions, failure of springs and streams, low-

ering of ground water levels, and serious increase in soil erosion are caused by removing forests from non-agricultural land, or by destroying the effectiveness of forest cover through repeated burning or excessive grazing."

Yellow silt loams of soil of Illinois, cherty silt loam of Arkansas, and sandy soil of Arkansas were used to see how much water is absorbed per second by undisturbed soils of oak woods, soil of burned woods and soil of open pastures. Equal amounts were applied four times in rapid succession.

On silt loam of Illinois, the undisturbed oak forest square foot of soil absorbed an average of 22.30 per cent of the water per second, whereas, on burned oak forest soil there was an average of only 4.57 per cent absorbed, and on open pasture soil only 1.43 per cent absorbed per second.

On Arkansas silt loam soil, the absorption of a cubic foot of soil per second averaged 42.88 per cent; burned oak forest soil averaged 8.80 per cent; open pasture averaged 9.77 per cent.

On the same soil occupied by old field pine woods, the average absorption was 31.05 per cent, and open pasture of same soil averaged 8.60 per cent.

On sandy Arkansas soil of undisturbed oak woods, the average was 45.17 per cent absorption per second, and on open pasture soils 17.11 per cent. "It is evident," says the author, "that even on sand there is a significant loss of water absorption brought about by exposure and pasturing."

SCRUB PINE USES

In the mountainous region of Georgia, the scrub or Virginia pine is abundant. Because of its limby nature it has not been valued for lumber. Other uses to which it can be put, however, make its development promising.

The tree grows rapidly. It has a habit that other southern pines do not possess, that of intermingling its branches with its fellows. As a result, natural pruning is not so active. This, with its habit of abundant limbs, results in knotty lumber.

One of the most promising uses of scrub pine is as pulpwood. It has low resin content; it is lighter of weight than shortleaf pine with which it is associated, and produces high grade kraft wrapping paper fibre board and printing paper.

The fuel value of scrub pine is high and it is particularly desirable where an intense heat is desired in a short time, such as is required in burning lime kilns. It gives satisfactory results when used to make charcoal.

A fad for knotty pine lumber for interiors can be no more satisfactorily met than by wood obtained from the scrub pine. Scrub pine is used quite generally for boxes and crates and nail kegs. Its sapwood makes good excelsior.

FIRST DISTRICT

Russell Franklin, Dist. Forester
Rome

Towerman on Job

The Gilmer County TPO has recently put on a towerman in the Rich Mountain lookout tower. The patrolman reports that this towerman has been a great aid to him in suppressing fires in the county. Rains and some snow in that section have helped to keep down the fires in December. The TPO members decided to let the applicants for the job of towerman bid for the job and a towerman was hired for \$32.50 a month.

Enlarged Lookout TPO

The Lookout Mountain TPO is being revised with Walker, Dade and Chattooga counties cooperating and subscribing funds annually for fire protection in the three counties. Much interest is being shown in fire protection by the people of these three counties and it is hoped that this will be an ideal TPO.

SECOND DISTRICT

W. D. Young, Dist. Forester,
Gainesville

Commerce T. P. O. Meeting

A meeting of Commerce TPO was held at the city hall in Commerce on the 20th of December. New officers were elected as follows: President, M. C. Sanders, Maysville; vice president, Charles Hardman. The secretary-treasurer will be selected by the former president and the two new officers.

A maximum assessment was fixed at 2 cents per acre.

Plans were made to man the three lookout towers beginning January 1, and continue through the fire season. The total area now under organized protection is 75,000 acres. The officers are working toward an increase of membership and acreage.

North Georgia Nursery

About 3,000 lineal feet of beds will be ready for planting at the North Georgia Nursery this planting season, thanks to FERA labor available at the Georgia Mountain Experiment Station. The beds are 4 feet wide, with sides constructed of split logs and slubs.

Some loblolly pine seed will be planted this year in addition to black walnut and black locust.

The National Forest Reservation Commission approved on November 23 the purchase of 2,053,169 acres of land to be added to the national forests. Of this 281,863 acres were in the southern Appalachians; 702,611 acres in the southern pine belt; and 403,114 acres in the Ozark mountains and central Mississippi.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

Seedlings Available

Twelve thousand cypress and six thousand walnut seedlings grown at the Gwinn-Nixon State Forest Nursery last year, are available for late winter planting. The walnut seedlings were grown from seed and are from 6 inch to 10 inch tall. The cypress were taken from wild stock and transplanted. They average approximately 18 inches in height and are from four to six years old.

Highway Beautification

One use for forest tree seedlings is highway beautification. The FERA authorities of Richmond county have taken into consideration the planting of all highways leading into Augusta. They plan to use pine seedlings. A survey has been made and the project recommended. Approximately fifty miles of highway will be planted. The upkeep of this highway beautification program will fall on the shoulders of the County Road Commission which has agreed to protect the trees until they become of sufficient age to prevent them being killed by fire or destroyed by cultivation along the edges of the right-of-way.

Cultivated Firebreaks

Firebreaks surrounding the Gwinn-Nixon State Forest will be cultivated next year. Arrangements have been made to lease the land, which totals approximately six acres. In consideration of rental, the renters have agreed to report and put out any fires burning on or near the forest. By cultivation, the breaks will be kept free from grass and weeds.

Last year some 50,000 trees were planted on the forest. The species included in the planting were Slash Pine, Longleaf Pine, Black Locust, Black Walnut, Bald Cypress and Red Cedar. This winter, the fire breaks surrounding Nixon Forest were burned to get rid of the grass, weeds and other inflammable material. The burning was a matter of economic protection.

Milledgeville Project

The CCC side camp at Milledgeville, which was abandoned in November on account of an epidemic of dengue fever, has been reoccupied. This side camp is one of the projects of Camp SP-5, Crawfordville, and is prosecuted on state hospital property, comprising some 5,000 acres of timbered and wooded land.

The U. S. Forest Service estimates that 533,579,240 acres of forest land in the United States need fire protection. This is about one-fourth of the area of the United States.

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

President Roosevelt to Harvest His Pine Mountain Farm Timber According to Good Forestry Practices

According to Mr. Otis Moore, manager of the Roosevelt farm near Warm Springs, President Roosevelt has planned to cut the merchantable pine timber on his farm here. Mr. Moore will manage the operation, and will run the saw mill—a portable tractor outfit. Whether the lumber is to be used on the farm or sold was not stated, but at any rate, the timber is to be cut according to good forestry practices.

The district forester has been asked to assist in arriving at the minimum diameter limit, number of seed trees to be left per acre where clear-cut, fire protective measures, disposal of slashings, and other practices incidental to good forestry. It was only to be expected that, because of his great interest in the conservation and perpetuation of our forests, President Roosevelt would insist on harvesting his own timber according to the best forestry practices.

Taylor-Talbot T. P. O. Employs Patrolman

The Taylor-Talbot TPO has employed Mr. R. E. McCants as full time fire patrolman. Mr. McCants will be required to contact every member of the TPO for the purpose of educating the landowners regarding fire protection, and to collect the two cents per acre assessment now due. He will also direct fire fighting activities for this organization. The TPO is planning to put on another patrolman a little later.

The Taylor-Talbot TPO has an excellent system of primary firebreaks constructed by the CCC. It has been difficult to knit the members of this organization into a cooperating unit due to the small sized ownership and other factors, but now that the TPO has taken this important forward step we feel that the importance of proper fire protection will be realized and that this is the turning point towards an active and efficient organization.

Butler Naval Stores Company Still Burns

The turpentine still of the Butler Naval Stores Company of Butler burned to the ground early in December. Rosin and turpentine nearby was saved, however. The tremendous volume of dense black smoke was visible for many miles.

Mr. J. S. Green, manager and owner, sustained a heavy loss, but such incidents are a part of a turpentine man's business and we found him building a new still almost before the ashes of the burned one had cooled. Extension Specialist K. S. Trowbridge assisted in the erection of the

new still according to government and insurance specifications.

St. Elmo Garden Club

The district forester, in answer to the request of Mrs. Lawrence Murray, and members of the St. Elmo Garden Club of Columbus, gave a talk to this garden club on the subject of Conservation and Recreation, a similar talk having been given in November before the Marguerite Garden Club. A member of the St. Elmo Garden Club was writing a play based on Dr. Chas. H. Herty and his Pulp and Paper Mill work with southern pines at Savannah.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Treutlen T. P. O.

The Treutlen T. P. O. has reworked over 75 miles of primary firebreaks which were originally constructed with E. C. W. funds. The firebreaks were reworked with a disc harrow, drawn by a caterpillar tractor and a good, neat job was obtained.

The cost of reworking 20 foot primary firebreaks, using the above equipment, costs three dollars per mile. About ten miles per day can be easily reworked by using a crew of three men, one tractor man and two helpers to go ahead and remove any trees that might have fallen since the original work was done.

Members of the T. P. O. have also constructed over fifty miles of secondary fire breaks. Some are solid plowed, eight feet wide and others are of the plowed and burned type, 20 feet wide.

The T. P. O. has also hired lookouts to man the two towers, constructed from E. C. W. funds. These lookouts have been up since November 1st. Quite a number of fires have been reported, but none of them have burned over any large area, as they are immediately put out by the landowners and in some cases by members of the Camp P-61, which is located in Soperton.

Emanuel County T. P. O.

The County Commissioners of Emanuel county voted to purchase three 100 foot steel, lookout towers to cover the lands listed in Emanuel T. P. O., which will give a county wide detection system, covering 250,000 acres of timber land. The type of towers desired has been decided upon and at the meeting of the commissioners on December 19th a formal order was placed for the three towers.

Fifty miles of telephone line will be constructed to adequately connect the three tower system and enable phones to be placed at strategic points in the county, where fire fighting crews will be available at all times. The wire and phones for the line will be purchased from E. C. W. funds and erected by the Swainsboro side camp, which is a unit of Camp P-61, Soperton.

Members of Emanuel T. P. O. have already constructed 100 miles of secondary firebreaks, solid plowed, 8 to 10 feet wide. They are so constructed that the tracts of timber are broken into approximately 40 acre blocks. Work of this type is subject to a refund, after it is approved by some official of the service and an inspection of the work is made. Firebreaks of this type will cost \$2.50 per mile.

Ogeechee T. P. O.

The Ogeechee T. P. O. recently purchased 3,000 fire signs and five Smith Indian pumps. The signs will be placed on T. P. O. lands. The fire pumps are to be used for fire fighting by the T. P. O. members.

The members also hired a patrolman who assumed his duties on December 1, 1934 and we will try and make him a full time patrolman, being on duty twelve months in the year. When the fire season is over, he will be used to carry on an educational campaign the T. P. O. will put on.

Vocational School Work

At present visits are being made to the twenty-one white schools having forestry projects in this district. Demonstration and field trips are given the boys who are taking vocational work. The subjects taken up and demonstrated include tree identification, fire protection, forest management, uses of Georgia wood, simple surveying and measurement of standing timber.

Where new schools are visited, type maps of the school forest are being made and the two ¼-acre sample plots laid out. When the maps are completed they will be colored, as to the different types found on the area.

Tower and Telephone Work

Work on the steel lookout towers being put up on Tar City T. P. O., Tattnall county and Ogeechee T. P. O., Chatham county, is going forward rapidly. The tower at Tar City T. P. O. was purchased from E. C. W. funds and one on Ogeechee T. P. O. was bought by the organization.

Telephone line construction is also progressing well. Some 1,200 heart cypress poles were donated by the Tar City T. P. O. and nearly enough cypress was given by Ogeechee T. P. O. to construct all of their lines.

Work on Tar City towers and telephone lines is being done by P-82, Reidsville and on Ogeechee T. P. O., by P-81, Bloomington.

It is estimated that 658,000 pounds of turkey were used for CCC camp Thanksgiving dinner and a like amount used for Christmas.

DuPre Barrett, extension forester of the State College of Agriculture, suffered serious injury from a fall which has kept him confined for two months. His many friends will be glad to know that he is recovering.

EIGHTH DISTRICT

**H. D. Story, Jr., Dist. Forester
Albany**

Crisp County Plans T. P. O.

Due to interest on the part of the county agricultural agent and several land owners, in fire protection work, several meetings have been held in the Penia community of Crisp county for the purpose of organizing a timber protective organization. As yet the organization has not been perfected, but interest has been aroused to such an extent that the land owners are expecting at the next meeting, which is to be held some time in the near future, to enter into this thing whole heartedly, and start the nucleus of an organization that has every promise of expansion.

Army Barbecue Host

The members of the Flint River Timber Protective Organization were guests of the Army at a barbecue at P-67 on Thursday, December 20. The barbecue dinner was followed by a business meeting of the organization at which time assessments for 1935 were voted and new officers installed.

The Army personnel has given good cooperation in these TPO meetings, and this meeting was no exception.

Tree Nursery Notes

Shipment of seedlings from the Albany nursery was started December 1, and due to the large demand it has been necessary to prorate orders, to furnish everyone some planting stock.

Developments are being planned at the nursery and it is expected to expand to sufficient size to come nearer meeting the demand for 1935-36. An abundant supply of seed has been stored for next year's planting, and in order to save time and expense, drill markers and planters have been perfected at the nursery to speed up planting.

A simple mechanical box has been perfected at the nursery, which not only cuts down the time required at planting, but will insure good seed distribution in the drill and will not vary over 20 seed in number to each four feet of drills.

INTEREST IN TREE SEED BEDS

Rural high schools having vocational agricultural teachers are showing more than usual interest in establishing tree seed beds to meet local demand for planting stock. Several are enlarging their seed beds after canvassing their communities for possible demands.

Pines and black locusts are the favorite planting stock, pines for pulpwood and locust for fence posts.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE GOLD DEPOSITS OF GEORGIA

By ROY A. WILSON

(Published by permission of the Director, United States Geological Survey)

ARTICLE 4. Present Mining Activity

Note: Dr. Wilson's articles were written in August, 1934. In order that the description of mining and prospecting activities might be brought up to date as of December 15, 1934, the State Geologist has re-visited most of the properties and has added numerous notes and insertions, all of which are indicated by italics and are not to be ascribed to Dr. Wilson.—Richard W. Smith, State Geologist.

Here and there over the gold belt, especially in localities that have produced gold in the past, the placer and saprolite deposits are worked from time to time by a small group. Most of these miners are local farmers or landowners who operate with pick and shovel and sluice box, discontinuing their gold mining when the water gets too low, when farm work demands their attention, or when more lucrative labor can be obtained. Few of these miners average

more than a modest daily wage. An occasional richer find may create much local excitement.

There are several counties where mining operations are of sufficient magnitude to merit more detailed descriptions. Some of these properties have afforded valuable data on the problem of Georgia gold deposits.

Lumpkin County

Battle Branch Mine—The mine at present creating the greatest interest in this area is the Battle Branch mine, a short distance west of Auraria, close to the Etowah River (fig. 6). Exploratory work in the sulphide zone has opened up some pockets or shots of high-grade ore. The mine is under the management of Mr. R. A. Newton. The history of this property is typical of many of the mines along the gold belt. "Gophering" for richer streaks in the oxidized portion of the lode and hydraulic mining of the saprolite have been carried on from time to time in the past, mainly before 1900. The present operations include reopening an inclined shaft into the sulphide zone and extending a shallow drift from this shaft. A small amount of stoping has been done along the richer parts of the ore body. In addition to this work, another

shallow tunnel has been extended. Enough free gold was recovered by panning the ore from the rich shoots to pay for the cost of deepening the shaft to 200 feet, at which level another drift has been started, and for the erection of a small mill. The mill consists of a jaw-crusher, a 10-stamp Straum circular stamp-mill, amalgam plates to recover the free gold, and a Wilfey table to recover the sulphides, which are now being stored for later shipment to a smelter. All the ore from the mine, low-grade and rich shoots alike, will be treated in the mill. This property typically illustrates the characteristics of lode deposits described in a previous article. The high-grade ore represents the "lucky find" that now and then occurs in gold mining. One of the interesting things about the mineralization in this lode is the close association of the gold with galena (lead sulphide).

Lockhart Mine—The Lockhart mine, a short distance east of Dahlonega on Yahoola Creek, is another property on which systematic exploration of the deeper part of the lode has been in progress. Mr. W. M. Grant was in charge of operations. This mine has had a long history. Past operations have included hydraulic mining of the saprolite and extensive gophering for richer pockets in the oxidized zone of the lode. The recent operations included the sinking of a vertical shaft to a depth of 148 feet and drifting along the lode from this shaft to explore and block out whatever ore might be encountered. Development work here is confronted by a problem which should be considered in all plans for mining the deeper parts of the lodes in this district. The mineralization is characterized by an abundance of garnet impregnating the veins and altered country rock. This feature, together with the general toughness of the country rock, appreciably slows up drilling and breaking of the vein material. As the development work progressed it became apparent that a fault parallel to the general strike had at places considerably limited the size of the ore body, both horizontally and vertically. The work was stopped and the property abandoned by Mr. Grant in November. The lack of success at this particular property is an example of the hazards of mining, but by no means should it deter similar exploratory work by private capital on other properties where geologic conditions appear to be favorable.

Barlow Mine—Carey, Inc., under the direction of Mr. Reg. A. Brett, have cleaned out, widened, and deepened to 50 feet an old shaft in the bottom of the Barlow Cut, southeast of Dahlonega, the largest of the old saprolite workings in the district. This struck a sulphide lode about 5½ feet wide, thought to lie to the west of the main Barlow lode. They have drifted for 160 feet south of the shaft and are now stoping upward along the lode. A mill has just been erected, consisting of a jaw-crusher, Ellis ball Chili mill, Ainley centrifugal bowl con-

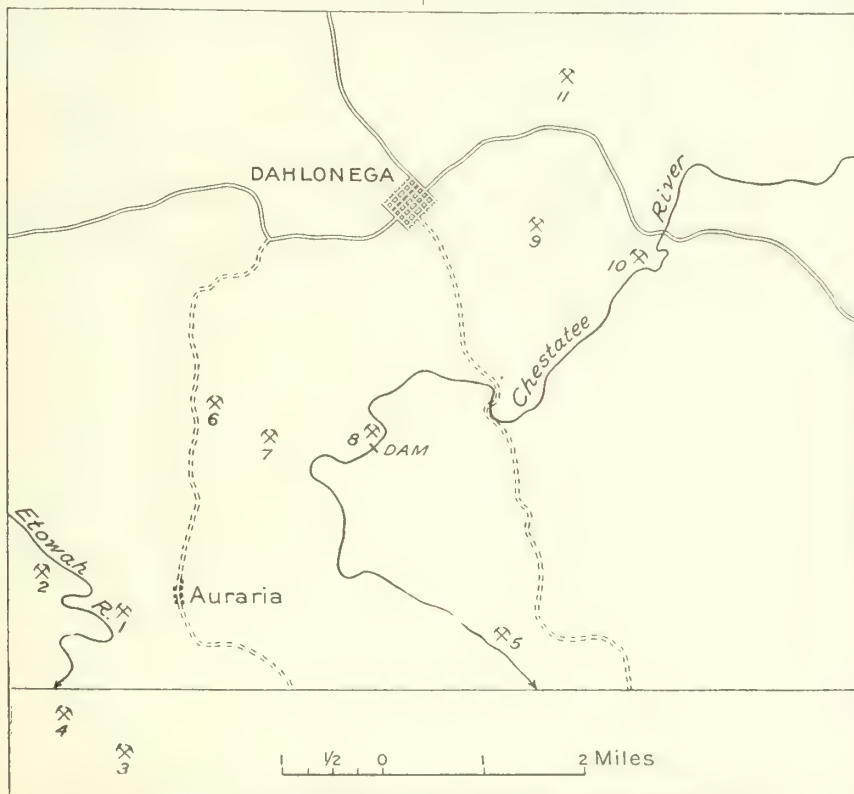


Figure 6. Sketch map of Dahlonega area showing location of active properties.
1. Topabri mine, 2. Battle Branch mine, 3. Baggs Branch placer, 4. Saprolite mine, 5. Long Branch placer, 6. Barlow cut, 7. Bunker Hill placer, 8. Briar Patch placer, 9. Lockhart mine, 10. Boly Field mine, 11. McDonald mine.

centrator, amalgamation plates, two Erhenwald flotation cells, and Wilfey table. The free gold will be recovered in the Ainley bowl and on the plates, and the sulphide concentrates will be shipped to a smelter.

Lumpkin County has produced a large amount of gold from its saprolite deposits. In the period between 1880 and 1895, when saprolite mining was at its height, nearly \$1,250,000 in gold was produced in this county, largely from saprolite deposits. Deep open cuts scar the hillsides in many parts of the district, showing that the promising saprolite areas were pretty thoroughly mined out. The future of saprolite mining lies in working lower-grade deposits, which were not considered profitable in the past. The successful recovery of the fine gold from the clays, a problem which is still in the experimental stage, would probably revive this type of mining to some extent.

Topabri Mine—The single major hydraulic operation in the county at the present time is the Topabri Mine, west of Auraria, on McKlusky Creek, close to the Etowah River. This property is under the management of Mr. Bartlett F. Johnston and has been in operation for about three years. The material is sluiced down the creek through several hundred feet of flume equipped with riffles, to a small stamp mill near the river, where the coarser fragments pass through the stamps to a small amalgamation table. The fine material passes into settling tanks and then over Gibson impact amalgamators. Systematic experimental work has been carried on here for some time on the problem of recovering fine gold. At present the mine is shut down for the duration of the winter months.

McDonald Mine—The McDonald mine, several miles northeast of Dahlonega, under the management of Mr. Carl McDonald, has been operating for several months. The exposed lode shows deeply weathered granite containing small stringers and kidneys of auriferous quartz with pyrite (iron sulphide). This saprolite material is mined by washing and with pick and shovel and is then treated in a small stamp mill.

Placer mining in Lumpkin County is at present confined to the reworking of stream gravel at several localities by small groups using pick and shovel and sluice box and to two operations on a somewhat larger scale.

Baggs Branch Mine—The Dixie Gold Mining Co., with Mr. William Löffler in charge, is reworking the stream gravel of Baggs Branch about 2 miles south of Auraria. The equipment consists of sluice boxes, a hydraulic lift, and a small hydraulic giant. Work on this placer was temporarily stopped in October. At present plans are being made to hydraulic mine a small saprolite deposit. The gold in the fine material will be recovered in a sluice box and the coarser material will be treated in a small stamp mill.

Long Branch Mine—Southeast of Dahlonega, at the junction of Long Branch with the Chestatee River, a small chain elevator has been installed [by the *Ranald Gold Mining Co., Mr. W. R. Shillington in charge*] to excavate the sandy alluvium. This operation is based on the belief that the early placer miners who worked in this area were not equipped to work the water-saturated deposits adjacent to the river. The company hopes to find some rich streaks in the gravel next to bedrock. This work has been hindered by the old problem of lack of equipment that would handle the water. The company has also done some prospecting on the placer deposits up Long Branch, on the weathered portions of two narrow lodes just west of the branch, and on a saprolite deposit south of the Chestatee River.

Work is beginning on the following properties as this article is written (August, 1934): Mr. Robert H. Reid plans to rework the Bunker Hill property, southeast of the Barlow cut, with a drag-line outfit [not yet begun]. The Briar Patch placers, on the Chestatee River south of Dahlonega, are to be reworked by the same company that is operating the Topabri mine. A modern dam is being constructed on the river for this purpose [now held up until a question of riparian rights is settled]. Work has been started on the old Boly Field property, east of Dahlonega and adjacent to the Chestatee River [by the *Bowsend Mining Co., Inc.*], under the direction of Mr. Charles A. Roberts [and Mr. Herbert G. Campion]. The Chestatee River for about 1000 feet has been diverted into an old channel, and in the spring they expect to start placer operations in the former channel. In the course of this work they uncovered and cleaned out an old inclined shaft that went 60 feet into the bedrock with a short drift at the bottom. This followed a narrow vein and is thought to be the old Boly Field shaft said to have been sunk in 1848 along a rich pocket. A wide saprolite zone on both sides of the river is now being prospected.

The Reliance Development Corp., in charge of P. G. Jacobson, E. Samuelson, and F. Lindberg, is prospecting the Whim Hill saprolite deposit about seven-eighths of a mile north of Auraria. A number of rich shoots on this property were "gophered" to water level some 30 to 40 years ago.

The Findley mine on the north end of Findley Ridge near Dahlonega has recently been sold to Mr. Cornelius O'Kane of New York. Prospecting has been started and it is reported that equipment will soon be installed for hydraulic mining of the remaining saprolite deposits.

Pine Seed for Planting

Anyone desiring pine seed for planting may obtain them by writing the educational manager of this office, who has the names of vocational agricultural teachers whose students have gathered seed for sale.

GEORGIA LEADS IN CLAY AND FULLER'S EARTH 1933

Georgia led the nation in the production of clay and fuller's earth in 1933, according to the preliminary figures in the 1934 Minerals Yearbook just released by the U. S. Bureau of Mines, Washington, D. C.

The clays produced were principally the sedimentary kaolins of the fall line district of middle Georgia and represent a value of nearly a million and a half dollars. The principal uses were as paper filler, china clay, and fire clay.

The value of Georgia's fullers earth production in 1933 was not given, but the value of the total amount produced in the United States was approximately two and a half million dollars, Georgia being the largest producer. For statistical purposes the Bureau of Mines has classed as fuller's earth all natural bleaching or filtering clay-like materials requiring no chemical treatment for activation. The material produced in Twiggs and Wilkinson counties is generally termed "Bleaching Clay" by the producers and is used principally in clarifying vegetable oils. The material produced in Decatur County is used principally for mineral oils. Other clays have been found recently in Dade, Walker, Crisp, Grady, and Thomas counties, which may eventually be produced for such purposes.

The Minerals Yearbook also lists Georgia as a leading producer of marble, granite, manganese ore, barite, ocher, and bauxite. While Georgia's gold production in 1933 increased 280 per cent, its value was not comparable with the production of the western states. The change in the price of gold and the renewal of mining activity in Georgia indicate an even larger increase in the value of Georgia's gold production for

PLAINS SHELTER BELT SILCOX THINKS FEASIBLE

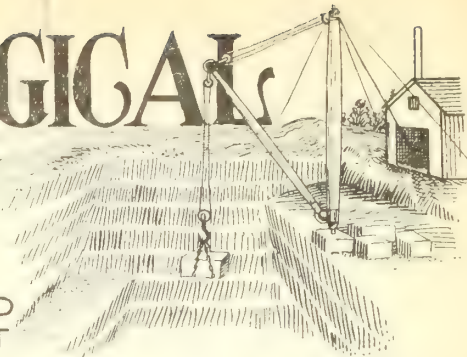
"If trees are planted now and they are selected with the view to withstanding the drouth, there is no doubt that shelter belts can be established where the average annual precipitation does not fall below 18 inches," said Chief Forester Silcox of the U. S. Forest Service before the annual meeting of Land Grant Colleges in Washington.

Attention was called to the existence already of 2 million acres of shelterbelts in the plains states from North Dakota to Texas, as sufficient demonstration of the feasibility of the project. He said, however, if the drouth in the region of the past few years was to be considered a permanent change of climate, people should move out of the region; but he counted on a swing-back to normal precipitation adequate to maintain the shelterbelts as well as many agricultural uses.

Dark rosins are being mixed experimentally in various proportions of tar for road surfacing in France.

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DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



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No. 2

RENFROE'S PINE-CORN RECORD, FOURTH YEAR

**Slash Pines Attain Maximum Height
209 Inches, Maximum Diameter
5 1/4 Inches With Average 4
Inches—Pulpwood Size in 4 Years
—Last Corn Crop a Failure**

The fourth year's record of slash and longleaf pine growth in Marion Renfroe's pine-corn experiment near Quitman, continues to show phenomenal results. In four seasons' growth slash pines have averaged an inch to the diameter each year, and have demonstrated the possibility of growing trees to pulpwood size in four years—a year sooner than the most optimistic had expected. But as a rule, it is not advisable to cut trees this size for pulpwood, since it is a period in the life of the tree when it is making rapid growth of commercial wood.

The Renfroe plantings of one year old seedlings of slash and longleaf was made January 27, 1931, on land comparatively poor. The undertaking was the outcome of a suggestion made by Dr. Charles H. Herty at the annual meeting of the Georgia Forestry Association, held at Albany in 1930, attended by Marion Renfroe. Dr. Herty expressed a desire that someone carry on an experiment of intercropping young pines with corn.

Careful annual measurements of the growth of the pines and the yields of corn have been kept by Mr. Renfroe. His diameter measurements were made at 10 inches from the ground instead of the usual 4 1/2 feet high.

Pine Growth Record

Both diameter and height growth measurements have been made each year. Both slash and longleaf pines were planted in the experiment. The record of slash pine—the more rapid growing—is as follows:

Slash Pine

Average Height June 21, 1932, 48 inches; October 25, 1933, 110 inches with some 137 inches; Jan. 9, 1935, 162 inches, with some 209 inches.

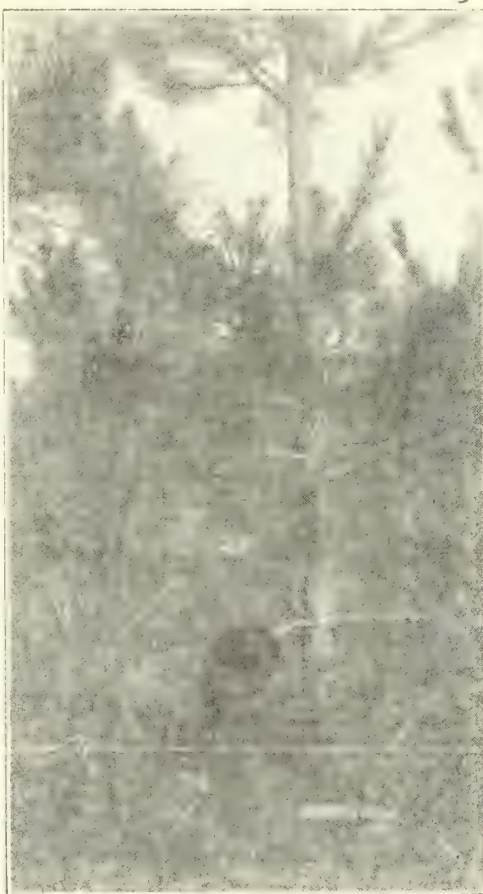
Average Diameter (10 inches from ground) June 21, 1932, 1 inch; October 25, 1933, 2 3/4 inches with some specimens 3 1/2 inches; Jan. 9, 1935, 4 inches with individuals 5 1/4 inches.

Longleaf Pine

Average Height June 21, 1932, no growth except in foliage; Oct. 25, 1933, 4 feet 2

inches, with some specimens 7 feet; Jan. 9, 1935, 8 feet with some individual trees 12 feet 2 inches.

Average Diameter (10 inches above the ground) Oct. 25, 1932, 3/4 inch with some specimens 1 1/2 inches; Jan. 9, 1935, 2-2/3 inches with some specimens 3 1/2 inches.



Renfroe's 4-Year Old Slash Pines.

Corn Crops

Three plantings of corn have been made and ordinary cultivation given. The first crop gave a net profit of \$3.42 per acre; the second, which was a poor season, made a small profit, and the third yielded a net profit of only 23 cents per acre. The fourth year was a failure, due, according to Renfroe, to defective seed followed by replanting, which in turn suffered from drouth. He has not computed his loss.

No further corn planting is considered advisable because the trees have practically covered the land with their crowns.

TREE SEED BEDS FOR PLANTING STOCK

**Local Demand for Planting Stock
Make Tree Nurseries Promising
Investment—Not Difficult but a
Particular Job**

A number of people collected tree seed last season with the expectation of disposing of them to the state tree nurseries, only to find that CCC men had been employed to gather seed for the needs of the nurseries. Other avenues of sale seem to be well supplied, and as a consequence, several seed collectors find a supply on their hands.

While the market for seed seems well supplied, it is likely that the demand for seedlings will be greater than the supply. Tree planting is increasing rapidly. Land owners are planning to utilize abandoned farm lands to grow a crop of trees. The future seems bright for pulpwood. Trees planted now will be ready in a few years to help meet the demand for paper mills. Besides, there is soil saving and erosion prevention which trees will bring about.

The question is "Why not make a seed bed, plant the seed and sell seedlings?" If proper care is given the seed bed, more money can be made from growing and selling seedlings than in selling seed. A small seed bed 4 x 12 feet can grow 8,000 to 10,000 pine seedlings which will sell at \$1.50 to \$2.00 per thousand, whereas the seed that would plant the bed bring this season only about \$1.00.

Anyone desiring specifications for a seed bed and instructions as to its management, may write the Georgia Forest Service. It is not a difficult, but a particular job, to grow seedlings for the market.

The conclusion from the intercropping of the pines is that cultivation of the land has stimulated tree growth during the four-year period, and that corn for the four-years period, has more than covered the carrying charges.

Sawdust when treated with phenol by a process under development at the Forest Products Laboratory is capable of being pressed into smooth, hard sheets or molded shapes of dense and uniform structure.

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FUTURE CONSERVATION CODE IMPORTANT FORESTRY ISSUE

Some foresters hold, with reference to the future of that part of the lumber code dealing with forest management for sustained yields, that it should be voluntarily administered by timberland owners themselves, and not as a part of an industrial code of lumbermen.

Others hold that by voluntary action of both forest industries and timberland owners, with an expansion of existing code machinery, the objective can be attained.

Still others, who do not see hope for any substantial progress through voluntary action, believe in establishing federal and state conservation regulations, with competent men to enforce them.

General disappointment is felt in the results obtained under the voluntary arrangement. The west is ahead of the east. In the southern pine belt, 11,000 lumber operators have only one code compliance officer. Great regions of the east have none. Obviously, very little has been done, and nothing of consequence can be expected until there is a force employed that is commensurate with the enormous task, and is given adequate power to exact compliance.

CCC First Aid Certificates

One type of training which seems quite popular among CCC men is first aid to the injured. Records show that for the months of September, October, November and December, 1934, as many as 26,684 men received Red Cross first aid certificates after 15 hours study and successful passing of an examination. In Georgia 191 were successful.

THINNING RULES SUGGESTED FOR SUSTAINED GUM YIELDS

E. W. Hadley, U. S. Forest Service,
Issues Statements on Handling
Turpentine Forests to Conserve
Forests and Increase Gum Pro-
duction

"Suggestions for Sustained Yield Forest Management for Naval Stores" were recently issued by E. W. Hadley, senior forest code examiner of the U. S. Forest Service. The statement includes methods of survey, estimating future production, cupping, thinning and working faces, but in this article only the rules for thinning are presented. They are as follows:

"1. Description of stands to be thinned.

Longleaf and slash pine second-growth stands from 15 to 25 years old, containing 300 or more stems per acre, 100 or more of which are under 6 inches in diameter 401.2 feet above ground.

"2. Methods.

(a) Marking.

The following rules will govern the selection of trees to be left or cut:

(1) The spacing of trees left will average 15x15 feet (approximately 200 per acre) for longleaf pine and 12x12 feet (approximately 300 per acre) for slash pine. As a guide to obtain this spacing a tree competing on even terms with others is left, provided the average distance to other trees nearest it in three directions is 12 feet for a longleaf pine and 10 feet for a slash pine. Natural openings in stands will increase the average spacing to 15x15 and 12x12 respectively.

(2) Trees selected to be left will have large thrifty crowns and no defect such as crook, lean, large fire scars or evidence of disease or insect infestation. Size, promise and position of individual trees will all be taken into account, but trees equally good will be cut to obtain the desired spacing and relieve crowding.

(3) No trees having a diameter of 6 inches or more 4½ feet above ground will be indicated for cutting unless they are diseased, insect infested, badly fire scarred, leaning badly, crooked or otherwise defective.

(4) Lean will not be considered as a defect unless it is of a degree that will prohibit working for turpentine.

(5) Marking of small groups and long borders of large groups will be more conservative in general on the basis of more side light. Close standing groups of three or more trees with plenty of side room will be left intact unless one or more trees in center of group are crowded. Small, short trees in open will be left. Also, desirable trees closely spaced in rows but having plenty of room on two sides will be left."

One thousand tons of paper are required each year to print postage stamps of the United States.

ACID TREATED SEED BLACK LOCUST TO BE PLANTED

An increasing interest in growing black locust in Georgia is accompanied by interest in growing planting stock in seed beds.

Due to the hard seed coat, germination of black locust seed is slow, sometimes deferred for a season. A common practice is to soak the seed in hot water, but a better way is to treat them with sulphuric acid.

Sulphuric acid with specific gravity of 1.84 applied at the rate of one pound of acid to one of seed and kept in contact for an hour is reported to give good results. The seed are stirred to give a thorough contact.

Following the acid treatment, the seed should be spread out on 16 mesh galvanized screen. Beneath the screen an acid resistant container should be placed to catch and preserve the acid that will drain out in a few minutes.

Then the seed should be thoroughly washed to remove all the remaining acid. This washing should continue five or ten minutes, depending on the quantity of seed. The first applications of water should be heavy to keep down the heating caused by the combination of water and acid.

Following the washing, the seed should be dried out in a shady, cool place. They are then ready to plant and will germinate readily.

CLEAR CUTTING POLICY UNDER GERMAN RULE

Germany as a nation owns no forests, and has been regarded as a world leader in forest management, but this has not hindered the Hitler regime from undertaking to regulate forestry practices. Notable among the ordered changes is the cessation of clear cutting and the adoption of selective cutting. Under the clear cutting method, the forest is regarded as an even age crop to be harvested at one time and a new crop planted in its stead.

Under the selective system, trees are of uneven age and are harvested as each tree reaches a state of maturity.

The merit of the two systems is not to be judged by the edict of Hitler.

SAWS HARD ENOUGH TO CUT GLASS FOR TROPIC WOODS

The New York State College of Forestry, studying woods from Brazil jungles, found it necessary to have a saw with teeth hard enough to cut glass to cut some of the specimens. The saw can be sharpened only with diamond dust. Ordinary saws were rendered hot and dull before cutting six inches into the harder woods.

As a protective measure against introduction of the Dutch Elm disease from Europe, an absolute quarantine has been promulgated against further importation of the seeds of elm and its tree relatives.

HOLIDAY DEER HUNT OF PROMINENT GEORGIANS

Great Increase in Deer and Other Game Where Forest Fires Are Kept Out and Game Protected— Party Bags 18 Deer

Eighteen deer was the result of a holiday hunting party on Satilla Forest and Sea Island Forest. In the party were prominent state officials including Wm. B. Harrison, state comptroller; Jud Wilhoit, Chairman of the Public Service Commission; B. M. Lufburrow, state forester, all of Atlanta, and included in the party also were Major W. L. Harwell, Brunswick and R. F. Burch, Eastman.

The party began its hunt December 28 on the Satilla Forest of the Georgia Forest Products Company, as guests of W. Pierce and Carl Meschke. The hunters fared forth before the break of day and came back with six fine deer. December 29 was another lucky day. Again the happy but tired hunters brought in a half dozen deer. The two first days of a four-day hunt was turning out splendidly.

Knocking off on Sunday, the party spent the day at Cabin Bluff, recounting experiences and priming for the next two days on the Sea Island property. Three deer were bagged Monday and three Tuesday.

Many old timers declared the hunt to be the best they had ever had. Among them was Bill Harrison, who killed his 38th deer on this trip and B. M. Lufburrow, who killed two on the trip, one a 10-point buck, the prize of the hunt.

Jud Wilhoit and Willard Irwin, of Moulton, Alabama, killed their first deer and were duly initiated by being required to bear on their faces a smear of the deer's blood for 12 hours.

Two of the old timers, Major Harwell and Mr. Lufburrow, missed shots and were subjected to the hunter's penalty of south Georgia, that of having the tails of their shirts removed, Capt. Gregory officiating as the shirttail cutter.

A 23-pound turkey gobbler was too much of a temptation for R. F. Burch, who let go with a load of buckshot. How much of the 23 pounds of turkey the buckshot represented was not ascertained.

All were loud in their praise of the abundance of game, and all attributed it to protecting the forests from fire and the maintenance of the areas as game reserves. This protection has greatly increased the number of deer, wild turkeys and other game.

An Atlanta aftermath of the hunt was a venison dinner given by State Forester Lufburrow and Mrs. Lufburrow at the Candler Hotel in Decatur. The guests were the forestry office force, their wives, husbands and best friends. It was the first venison many of those present had ever eaten and proved a delicious experience.

Every employee was called upon to report on the faults, foibles and idiosyncrasies

of the force. It was a good natured exchange that everyone enjoyed. Then came dancing and bridge. It was in every respect a happy occasion.

RAYON PRODUCTION AT PAPER LABORATORY

Rayon machinery has been installed at the Pulp and Paper Laboratory at Savannah, where "artificial silk" will be produced from pine pulp.

The fact that pine pulp is adapted to rayon production has already been demonstrated by the use of pine pulp provided by the laboratory. For a further study whereby the full possibilities may be worked out, as to quality of product and cost of manufacture, the Chemical Foundation has generously continued its support of the laboratory by providing rayon manufacturing machinery.

Dr. Chas. H. Herty and his co-workers are enthusiastic over the use of southern woods not only in making rayon but other cellulose products.

GEORGIA LUMBER MANUFACTURING RECORD YEAR 1933 ISSUED

According to the Census of Manufacture for 1933, issued by the U. S. Department of Commerce, there were 669 wood working establishments in Georgia that produced 473,246,000 board feet of lumber, of which 420,450,000 were soft wood and 52,796,000 were hard wood.

The quantities of soft wood by tree species produced were 281,000 board feet of cedar; 7,400,000 of cypress; 412,737,000 of yellow pine; other minor production was white pine.

The quantities of hardwood by species were 5,643,000 ash; 56,000 chestnut; 2,665,000 cottonwood; 370,000 elm; 336,000 magnolia; 450,000 maple; 10,613,000 oak; 15,520,000 red gum; 5,484,000 tupelo; 10,913,000 yellow poplar; all others 699,000.

During the year 1933, Georgia produced 3,905,000 lath and 1,087,000 square feet of shingles. The preliminary report does not itemize the production of veneer and cooperage for Georgia.

LONGLEAF SLOW GROWER IN DENSE STANDS

According to studies by W. G. Wahlenberg of the Southern Forest Experiment Station, longleaf pine in dense stands of natural reproduction may attain dwarfishness that will persist 15 or more years.

While the investigator does not say so, it is evident that planting of longleaf pine seedlings with proper spacing is the more practical method of longleaf pine reforestation. Evidence of this appears in a record of Marion Renfroe's longleaf pine planting given elsewhere in this issue. In four seasons of growth the one year old longleaf pine seedlings averaged 2 2-3 inches in diameter 10 inches from the ground.

MUSEUM REHABILITATION IN PROSPECT FOR 1935

Rehabilitation of the State Museum on the fourth floor of the State Capitol is planned for the coming year, according to State Geologist Richard W. Smith, curator of the museum. The museum, which was founded in 1895 largely under the direction of Prof. W. S. Yeates, then State Geologist, has attracted hundreds of visitors to the capitol annually. It contains exhibits of rocks and minerals, game and fish, forestry, insects, agricultural products, educational work, archaeological and ethnological finds, and historical relics of Georgia. Lack of space has caused the museum to be limited to specimens from Georgia only.

The work planned for the coming year includes a revision of the displays of economic geology, a replacing of many specimens from closed mines by similar ones from mines now operating, a revision and enlargement of the game and fish, agricultural, and entomology exhibits under the direction and supervision of the heads of the departments concerned.

Recent additions to the museum include a display of newly mined gold nuggets, a movable exhibit of the queer flexible sandstone, a collection of Georgia gem stones cut during the past year, an educational exhibit of rattlesnake antitoxin, a model of the Indian council house recently uncovered at Macon, fresh forestry specimens, and an educational exhibit by the State Entomologist concerning the screw worm. All of the exhibits which were shown at A Century of Progress in Chicago have now been replaced in the museum.

TREAT TREES LIKE HUMAN BEINGS

"Trees, like people, are hampered in their physiological (or life) processes by the presence of foreign organisms in their bodies. Every person, who has been sick, can appreciate the functional disturbances in diseased trees, especially those which resemble in certain respects human diseases," says Dr. Ray R. Hirt, tree pathologist of the New York State College of Forestry, Syracuse, N. Y.

"The organisms which cause tree diseases may be bacteria, fungi, or insects. Large, tumor-like swellings, called galls, are not uncommonly produced on trees by certain of these organisms. These abnormal growths distort the trunk and branches, causing them to be unsightly, and may even cause death of the affected parts. One of the more common galls is that of plum and cherry trees, known as 'black knot.' The branches bearing these black, brittle growths should be operated upon and the affected parts removed and destroyed," says Dr. Hirt.

He: "How many kinds of wood are used in making the match?"

She: "Two kinds. He would and she would."

FORESTRY QUESTION BOX

Do trees that seed heavily grow less rapidly than trees producing few seed?

Liberal seeding is evidence of high vitality. Records have shown that more wood growth is made by heavy seeders than by light seeders. In selecting planting seed, it is better to take them from generous bearers because of their apparent greater vitality.

Are there large areas of cottonwood in Georgia?

The term "cottonwood" is loosely applied in this state to silverleaf poplar, Carolina poplar, swamp cottonwood and to *Populus Deltoides*. None of these appear in bodies large enough to be of commercial importance. They are scattered throughout the state.

What southern hardwoods are considered suitable for making paper or boxboard?

Black gum, tupelo, magnolia, bay, maple, yellow poplar, basswood, cotton wood, chestnut, birch, beech, sycamore, ash and other white woods. In several instances the woods would bring greater returns for other uses.

Is there any way that a timber owner can remove bark of pulpwood other than by hand?

A machine that can be taken into the woods that pounds off the bark very successfully and quickly has been put out by the Council Tool Company, Wananish, N. C. It takes 7½ to 10 horsepower to operate.

Do not authorities recommend burning off the woods to promote reproduction of Longleaf Pine?

Some important authorities recommend what is termed "control burning" for those years that longleaf pine have a good seed crop. For that matter, burning will facilitate contact of the seed of any kind of pine with the earth and better reproduction.

But is there not a better way? According to the U. S. Forest Service, fire damage to southern forests is approximately \$2.00 per acre. If this fire damage to the soil through the destruction of nitrogen and organic matter be added, the total loss will exceed the cost of planting pine seedlings.

Furthermore, not only will nursery grown seedlings provide better plants, but they can be set out so that there will be a more evenly distributed stand. So much so, that the burning method of seeding is by comparison a slipshod, improvident method.

"The farmers are being urged to plant trees on their idle acres. Well, a crop of trees, once it gets established, is going to be mighty hard to plow up."—Southern Lumberman.

THINNING MIXED FORESTS FOR MAXIMUM YIELD

Southern Forest Experiment Station Gives Rules for Improvement Cutting and Thinning on Sample Pine-Hardwood Area in South

Using an area near Urania, La., of a pine-hardwood type, the Southern Forest Experiment Station supervised an improvement cutting and thinning and has given the rules followed.

The pines were loblolly and shortleaf and the hardwood a mixture of several species. The average number of trees per acre was 843, pines averaging 445 and hardwoods 398. On the pines, 161 were 1 to 3 inches in diameter; 221, 4 to 7 inches; 43, 8 to 11 inches; 16, 12 to 17 inches; 4, 18 to 24 inches.

Of the hardwoods, 305 were 1 to 3 inches in diameter; 73, 4 to 7 inches; 7, 8 to 18 inches; 8, 12 to 17 inches; 4, 18 to 24 inches; 1, 25 to 31 inches.

The merchantable volume was 4,164 board feet of pines, 96 board feet of hardwood and 8 cords of pine pulpwood.

The rules for improvement cutting and thinning followed were as follows:

Pines—Under 4 inches in diameter, cut nothing. At 4 inches, cut only trees that seem certain will die before next cutting in 5 to 10 years. Trees 5 to 7 inches in diameter, cut freely, removing the poorer competing trees from around selected crop trees, and very poor trees from any position. Aim to give crop trees increased growing space for next 5 to 10 years. Crop trees are selected on the basis of good size, form and vigor, rather than spacing.

Trees 8 to 14 inches in diameter, cut sparingly, removing only the very poorest, most crowded, knottiest and most unsound trees.

Trees 15 inches and over (mature), cut trees the removal of which will apparently benefit the stand beyond their increased value if left. Size, quality, apparent or known growth rate, position and the necessity of leaving enough trees for a similar cut in 5 to 10 years, are factors to consider. This is the most difficult part of the marking.

Trees 15 inches and over (overmature and defective, frequently wolf trees), cut everything.

Hardwoods—Trees under 4 inches in diameter, cut nothing. Trees 4 inches in diameter, cut nothing.

Trees 5 to 7 inches in diameter, cut nothing, except an occasional bushy-crowned tree of poor form or species crowding a crop tree.

Trees 8 to 14 inches in diameter, cut or deaden occasional 8 to 9 inch trees as above. Cut or deaden all 10 to 14 inch trees of undesirable or unmerchantable species, form or condition, or where crowding more valuable trees.

Trees 15 inches and over in diameter (mature), cut for sawlogs or deaden all trees

except unusually fine trees which will increase greatly in value. (Few sawlogs were cut from this class and only two trees were considered good enough to leave.)

Trees 15 inches and over, cut for sawlogs or deaden everything.

HOW MUCH TIMBER HAS AMERICA CUT?

According to an estimate made by R. V. Reynolds, whose methods of computation have been approved by other foresters of prominence, the original stand of timber on the 822 million acres of timberland was more than eight trillion board feet. The total from 1630 to 1930 has been approximately 7.3 trillion board feet, of which 30 per cent was cut for lumber, 55 per cent for fuel, and 15 per cent for various other purposes.

The cut of fuelwood has declined markedly since 1900, dropping from 14.3 billion cords to 5 billion cords in 1930.

According to the statistics of Mr. Reynolds, the highest per capita cut of timber 1800-1930 was 470 cubic feet in 1800, declining gradually to 120 cubic feet in 1930, due principally to reduction in the use of fuel wood.

For the same period, saw timber cut dropped from 2,230 board feet per capita in 1800 to only 390 board feet per capita in 1930.

Since a house usually serves two or three generations of people, and some much longer, and since urban housing has tended toward crowding the family into smaller room space, and since other materials have in a measure supplanted lumber, the per capita consumption of lumber would not be expected to keep pace with that of the pioneering and expansion period, when settlers made generous use of cheap wood at hand to erect commodious structures.

DECEMBER FIRE RECORD

Fires reported in areas served by CCC camps, for December numbered 79, with an area of 5,497 acres burned over. The estimated damage to the forests is \$7,241.97. The average per fire was 70 acres, but 2 of the fires covered less than 10 acres.

Causes of fires show 21 to have been started purposely; 4 by railroads; 2 by campers; 1 by smokers; 2 by brush burners; 1 by lumbering; 2 by naval stores; 2 by range burning, and 15 miscellaneous.

"One third of the area of continental United States is forest or potential forest land. Sound economics require that this area be so managed that it may permanently support its fair share of the nation's population."—F. A. Silcox, Chief Forester of the United States.

Recent purchases for the national forest in the eastern United States were at an average of \$2.80 per acre.

FIRST DISTRICT

**Russell Franklin, Dist. Forester
Rome**

Pine Planting Demonstration

Mrs. B. T. Haynes, Rome, Ga., is now preparing her land for the reception of 10,000 loblolly pine seedlings bought from the Nursery at Albany. Mrs. Haynes is planting these seedlings on a hillside visible from the Rome-Atlanta Highway. This tract is to be used as a demonstrational tract for the purpose of showing the people in this section just how fast pines will grow if protected.

Finds Seedlings Scarce

Mr. A. G. Montgomery, Rome, Ga., placed an application for 20,000 loblolly pine seedlings, but was a little late as the supply from the Albany nursery was already exhausted. Mr. Montgomery states that he is now trying to get some seedlings in several of the Southern states to set out this year, but that his order for 20,000 loblolly still stands for next year also.

Black Walnuts Recommended

Mrs. M. E. Judd, Dalton, Ga., recommends black walnut seedlings for planting in north Georgia. Mrs. Judd states that the seedlings as purchased from the nursery at Blairsville require very little attention, grow very fast, and are very profitable.

Mr. Joel Stenbridge, Ella Gap, Ga., is trying black walnut seedlings under a mixture of pines and hardwoods. Joel is also filling in blank spaces all over the farm with other black walnut seedlings purchased from the nursery at Blairsville. Joel is a foreman at Camp SP-6.

TPO Items

The Lookout Mountain TPO is erecting a telephone line from one end of the area to the other to connect the two patrolmen and other points in the area. This will be a very valuable asset to the TPO as sometimes one of the patrolmen will see a fire over in the other's territory.

The Gilmer county TPO is now offering a reward of fifty dollars to any person getting enough evidence to arrest and convict anybody of setting fire in Gilmer county. This is a county wide TPO and it should be very easy to get a conviction.

WHEN TO CUT PULPWOOD

The Alabama Conference on Paper Products says, according to the Alabama Forest News:

"It appears that the most rapid growth of young pines is during the sappling and small pole stage. No trees under six inches diameter, breast high, should be cut for pulpwood. This is not only on account of the intrinsic value of such trees, but it also has important bearing on the cost of cutting and transportation."

FOURTH DISTRICT

**W. G. Wallace, District Forester
Columbus**

A New Use for Pine Straw

It may not exactly be a new use for pine straw, but it is a new use so far as your district forester is concerned.

Mr. W. H. Sorrells, near Macon, showed me a beautiful stand of Slash Pine which he planted in 1930 and which is now about 14 feet in height. There must have been about three acres, and I was admiring the stand and at the same time trying to think of it in terms of pulp wood, saw logs, etc., only to have Mr. Sorrells speak up and say, "Will this stand begin producing a lot of straw from now on?" I remarked that "It appears that it will. Why?"

To make a long story short, Mr. Sorrells has about 3,000 pigeons—that's a good many—and it is necessary to supply materials for the pigeons to use in making nests. Who would ever think materials for pigeons to make nests from would be a factor in the sort of business Mr. Sorrells is in. It is. According to Mr. Sorrells, it amounts to nearly \$50.00 annually, and the pine straw from his small pine plantation is going to save him that cost from now on.

Planting Pines—a Hobby

Forestry is a serious work, and as a rule most foresters think of planting, thinning, fire protection, etc., in terms of quantity and quality of the ultimate product, and profit to the producer. Also, he will think in terms of soil erosion control, game and fish, and various combination of best land use and forest practice. But does a forester ever think of planting as a hobby?

Reflecting on a good many plantings made in this district during the past few years I am forced to the conclusion that most of the smaller ones—one or two thousand pine seedlings—will be questionable ventures as to profit if profit in terms of dollars from wood products only is considered. Most of these small plantings were made by enthusiastic, forestry-minded people with little or no thought given to initial investment, taxes, fire protection, etc., as weighed against future net returns. Whether they realize it or not, most of these small plantings and many of the larger ones were planted and will be tended principally as a hobby.

The personal satisfaction of planting one or two acres in pine, tending the young trees and watching them grow into an aesthetically beautiful thing over a period of several years is, in itself, a compensation. I believe most of us have, to a more or less extent, that urge to work in the outdoors, and especially in the forests. If one can't satisfy that urge by giving one's life work to forestry, and very few can, why not look around you and see if there isn't some small area or large that is lying idle and that would profit one's body, brain and

soul to plant in pines. I think that in most cases one could safely gamble on it profiting the pocket book, also.

"Cedar-Pine"

Foresters are often confronted with the problem of correcting the opinions of individuals regarding such matters as, for instance, the conclusion of one good gentleman that the seed of longleaf pine reproduces the old field loblolly pine.

But my latest brain-buster is a "Cedar-pine." Mr. E. H. Pope, of Newnan, a very willing person whom I had been assisting in planting some pines, stated that several unusual trees were growing on his place which looked like a mixture of cedar and pine. I tried to assure him that such was not the case, and at his insistence plus my curiosity, we went to see the "Cedar-pine."

What we found was not a mixed tree of cedar and pine, but a group of several Virginia Scrub Pines (*Pinus virginiana*) which are ordinarily found in the mountains of North Georgia. To find a group of these pines growing naturally in the woods far south of its normal range was a surprise. Mr. Pope was elated at having such an unusual occurrence on his farm.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Ocmulgee TPO

The members of Ocmulgee T. P. O. in Telfair county has assessed themselves two and one-half cents (2½c) per acre to raise money to purchase one 100-foot steel lookout tower. This tower will be a supplement to the two towers bought for the T. P. O. from ECW funds.

The three towers will give ample coverage to the whole of Telfair county and all the Ocmulgee TPO. There is a good possibility that the Little River T. P. O., covering lands in Wheeler county, will also buy a tower which would adequately cover their TPO lands and tie in nicely with the towers in Telfair county.

Telephone lines will be constructed to connect the towers so that cross readings may be obtained on fires and some line will be constructed to isolated places where there are none existing. The TPO will furnish half of the poles and the rest will be given them by ECW construction, which will begin at an early date. Poles are being cut and distributed now and the lines will be constructed as soon as the towers arrive.

Vocational School Work

Visits have been made to all the vocational schools in the district and seven new forests have been established. The new school forests are located at Lyons, Alamo, Hiltonia, Swainsboro, Bay Branch, Montgomery High School, Sylvania and Ludowici. The schools having new forests are making more progress in their work than some

of the older ones, especially in fire break construction and preparing of seed beds.

Fire Season Begins

The year 1935 came in with an exceptionally dry fire season, but fortunately we have had very few fires reported over the district to this time, due mainly to the change of sentiment against woods burning in this section. The land owners are fast realizing just what the Georgia Forest Service is doing to help them protect their timber lands from fire, and are giving splendid cooperation.

Demonstration Planting

Through the courtesy of the E. T. Comer Company, of Millhaven, Georgia, we have been able to plant a three acre demonstration plot on the George Washington highway, about two miles north of Hilltonia. Slash pine seedlings from the Georgia Forest Nursery at Albany were used to plant this plot.

The E. T. Comer Company has been doing some firebreak work this year and have completed some real good breaks around the outside boundary of the property.

This property consists of 16,000 acres, of which 7,500 acres is timber land. A large percent of the timber is virgin long leaf, slash pine and cypress.

SEVENTH DISTRICT

**C. Bernard Beale, Dist. Forester
Waycross**

TPO Secretaries Meet, Discuss Maintenance

At a meeting of the TPO secretaries of district 7 on January 11 at the Waycross office, plans for maintenance of primary breaks and truck trails were discussed. A number of TPO's are considering purchase of tractor and plow units for this purpose. Other subjects discussed: Forecasting of bad fire weather, fire trailers, proper keeping of records. Attending the meeting were J. M. DuPuis, Secretary of Appling TPO; S. N. Smith, Secretary of Brantley TPO; K. G. Meschke, Secretary of Camden TPO; L. F. Morey, Secretary of Coffee-Jeff Davis TPO; W. C. Hopkins, Secretary of Charlton TPO; J. O. Rodgers, Secretary of Consolidated TPO; P. B. Copeland, Secretary of Hurricane Creek TPO; W. M. Oettmire, Secretary of Suwanee TPO; E. L. Knight, Secretary of Wayne TPO.

Annual Meeting—Coffee-Jeff Davis TPO

Presided over by Dr. Wilson, president of Coffee County Chamber of Commerce, one of the most successful and well-attended TPO meetings ever held, was the annual meeting of the Coffee-Jeff Davis TPO at Douglas, courthouse on December 12. Approximately 50 members were present. Many testified as to the value of fire protection and spoke enthusiastically about the success they had had in growing timber.

Regular speakers included W. H. Vickers, TPO President, who predicted that timber growing would largely take the place of cotton and exhorted all members to cooperate in fire protection. W. H. Bailey, TPO treasurer, testified that he regarded fire protection and timber growing as a business proposition worthy of business-like treatment, emphasizing the necessity for cooperation for successful protection. L. F. Morey, TPO Secretary, reported the activities of the TPO and described how the TPO tractor and plow was kept busy plowing secondary breaks. R. F. Burch, ECW representative, urged the TPO to continue its splendid program. R. E. Tittle, camp superintendent, at Douglas, outlined the work of the camp and exhibited a map showing primary breaks constructed and proposed. C. B. Beale, district forester, described the development of the TPO and described the progress being made in the technique of fire control. H. M. Sebring, assistant state forester, outlined the relation of the CCC work to that of the TPO and urged adequate provision by the TPO for maintenance.

At noon, the meeting adjourned to the CCC camp, where an oyster stew luncheon was served by the camp commander, Lieut. Walters.

Brunswick-Peninsula TPO to Build Two Towers

C. R. Turton, manager of the turpentine operations of the Brunswick-Peninsula Company, advises that lumber for two lookout towers in Glynn county is now being sawed. All materials for the two towers will be furnished by the Brunswick-Peninsula TPO, of which R. E. Benedict is president. The towers will be constructed by CCC forces and will probably be located at Zuta and Chappels Crossing.

Brantley TPO Holds Forest Fair

Under direction of S. N. Smith, TPO secretary and W. T. Clary, county agent, a forest fair was held at Nahunta on January 19. Speakers were Dr. C. H. Herty, who described recent technical advances in paper and rayon production; Dr. Shingler, naval stores technologist of Olustee Experiment Station, who described proper turpentine distillation; V. L. Harper, sivil-culturist in charge of the Lake City Experiment Station, who discussed proper forest practices for sustained naval stores production.

Many turpentine men and landowners attended from all over the county and section.

Hurricane Creek TPO Meets at Blackshear

For obtaining better cooperation from Pierce county members, a meeting of the Hurricane Creek TPO, embracing Bacon, Pierce and northern Ware counties, was held at Blackshear on January 16. District Forester Beale outlined the accomplishments of the TPO to date and stated the need for financial cooperation from the

members to carry out the TPO program. W. H. Harrison of Pierce county was elected to the Board of Directors; P. B. Copeland, secretary of the TPO, recommended to the board that several fire trailers be rigged up to be placed in each part of the TPO area. The board approved this and also promised to meet regularly. County Agents Nesmith, of Bacon, and Chaffin, of Pierce, were in attendance.

Ben Hill-Irwin May Organize

County Agent C. T. Owens, of Fitzgerald, is now attempting to arrange a joint meeting of landowners in Ben Hill and Irwin counties to organize a joint-county TPO. Several prominent landowners of both these counties have expressed interest and it is hoped that this TPO will soon materialize.

CCC Items

Camp P-52, Homerville, has two foremen, W. W. Mays, surveyor and draftsman, was transferred from McRae and F. L. McClung, telephone engineer, was transferred from Hinesville.

Camp P-59, Fargo, has some excellent firebreaks to its credit.

Camp P-60, Satilla Bluff, now has its forester's and officer's quarters completed. A new recreation building has also been moved over from the old camp-site at Colesburg. Wild turkeys are so thick down there one of the surveying "swamping" crews recently almost chopped a gobbler's head off.

Camp P-65, Jesup, is having a sweet time down in the Penholloway Bay section.

Camp P-68, Douglas, is grubbing everything out without the help of a tractor. The tractor is kept busy plowing and grading.

Camp P-70, Nahunta, is having its foresters' quarters enlarged. The educational Advisor's quarters are also being "stuccoed" on the exterior.

Camp P-62, Baxley, has been going through some tough country over on the Wayne county line.

GOVERNMENT NAVAL STORES LOANS

Approximately 75 per cent of gum turpentine and gum rosins in stock at Savannah, Jacksonville and Pensacola are held as collateral by the Federal Commodity Credit Corporation for loans approximating \$4,000,000. The maturity date on loans has been extended from February 1 to May 1.

Shallow Wells Used For Fire Suppression

A bulletin issued by the Michigan Forest Fire Experiment Station tells of the successful use of shallow wells as a source of water in forest fire suppression, where the water level is around 20 feet of the surface.

Over a considerable area of Georgia shallow water tables make this method applicable.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE GOLD DEPOSITS OF GEORGIA

By ROY A. WILSON

(Published by permission of the Director
United States Geological Survey)

ARTICLE 5 Present Mining Activity (Continued)

Note: Dr. Wilson's articles were written in August, 1934. In order that the descriptions of mining and prospecting activities might be brought up to date as of December 15, 1934, the State Geologist has re-visited most of the properties and has added numerous notes and insertions, all of which are indicated by italics and are not to be ascribed to Dr. Wilson.—Richard W. Smith, State Geologist.

WHITE COUNTY

All the present mining in White County is confined to reworking stream placers. The topography of this general region has

Hudson Mine—On Duke's Creek, about 3 miles south of the Bean Creek area and a short distance west of the Cleveland-Helen highway, Mr. W. C. Hudson is mining old placer ground with a hydraulic giant. Low water has necessitated a temporary shut-down. Operations were resumed in September and soon after a rich streak was found that contained a number of fair-sized nuggets.

Dunbar Mine—Mr. A. A. Atwater [and Mr. C. L. Dunbar] has moved in a steam shovel for placer operations on an area about 4 miles north of Cleveland. Recoveries from this placer proved to be disappointing and in November the operations were transferred to Duke's Creek on the Cleveland-Helen highway, adjacent to the Hudson mine. Mr. Atwater has recently died and the work is now in charge of Mr. Dunbar and Mr. L. E. Cobb.

Cox Bottoms Mine—Mr. H. L. Schwalbe has recently moved a drag-line excavator

The future of placer mining in this county, as well as in other parts of the gold belt, will depend on economical operation by drag-line excavator, steam shovel, dredge, or hydraulic giant; or by any method enabling gravel averaging as little as 10 or 12 cents to the cubic yard to be worked at a profit. Detailed testing of the placer ground before operations are started is strongly recommended. From the information furnished by properly distributed test pits and bore holes many valuable data can be obtained as to the distribution of the gold and the best method of working the deposit. The tendency for the gold to concentrate in the basal portions of the alluvium next to the bedrock is again emphasized. The more complete recovery of the fine gold is a problem facing all placer operations.

CHEROKEE COUNTY

In Cherokee County there are several properties which have had a history of profitable operation.

Creighton-Franklin Mine—The Creighton-Franklin mine, 7 miles southeast of Ball Ground, on the Etowah River, was at one time the most extensive gold mine in the State. Owing to accidental flooding, this mine has been abandoned for a number of years. Its most interesting feature is the depth of the workings, some of the shafts extending over 500 feet vertically below the surface. The available data that can be relied upon indicate that the ore bodies encountered in the underground workings were ellipsoidal chimneys or shoots of moderate size associated with conspicuous rolls in the schistosity of the country rock, as described in a previous article. This property has recently been prospected under the direction of Mr. Joseph B. Sitton. It is reported that diamond drilling will soon be undertaken in an effort to determine the depth of the mineralization.

301 Mine—Work has been resumed at the 301 mine, about a mile west of Holly Springs, under the direction of Mr. W. H. Fluker, of Thomson, Georgia. An inclined shaft to a vertical depth of 80 feet and short drifts in both directions along the strike of the lode had been completed at the time the property was visited. The ore is treated in a small mill. The shaft is being extended to a depth of 200 feet and is now 150 feet. The lode is widening slightly and its dip appears to be a little flatter. Some changes are being made in the mill equipment and a small cyanide plant is being added.

Other abandoned mines in this county which were operated on a large scale include the Cherokee, about 4 miles west of Holly Springs, adjacent to the Little River, and the Sixes mine, about 2 miles north of the Cherokee. The productive possibilities of these properties can be determined only by additional exploratory work. It will be necessary to reopen the underground workings and sample and assay all the exposed ore bodies systematically before any satisfactory decision can be made as to the future value of these mines.

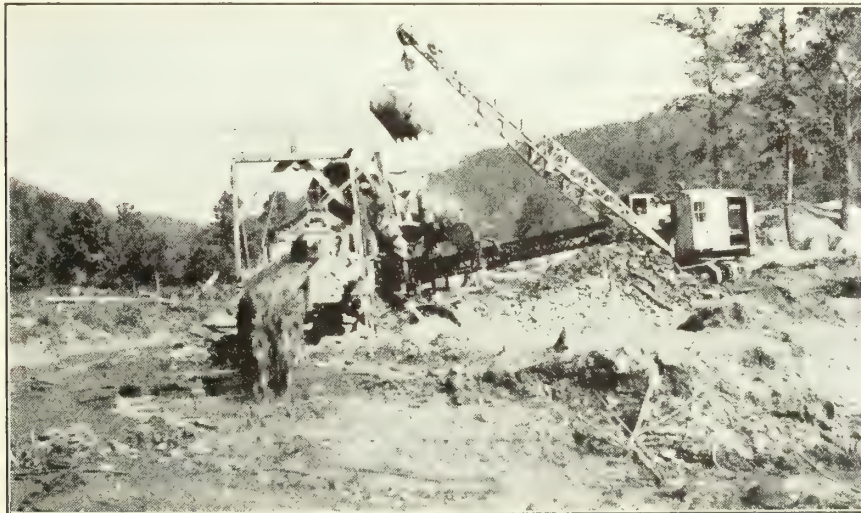


Figure 7.—View showing drag-line excavator working placer ground on Bean Creek in White County. Material from shovel passes through revolving screen, from which coarse gravel passes out on conveyor belt to pile and finer sand and clay go into sluice box.

favored the development of placers, and a considerable portion of the gold obtained in this county in the past has come from these deposits.

Bean Creek Mine—Mr. T. J. Stevenson is operating a drag-line excavator on Bean Creek a short distance from Nacoochee and several miles north of Cleveland. The alluvial debris is scooped out by a 1-ton bucket and passed through a screen separator, from which the finer material goes into a sluice box (fig. 7). Several hundred cubic yards of material is handled each day. This placer ground was extensively worked in the early days for its richer streaks.

to the Cox Bottoms on the Little Tesnatee Creek, about 4 miles north of Cleveland. This placer deposit is said to have been partially worked years ago.

Poland and Beach Mine—Mr. C. O. Poland and Mr. W. B. Beach are prospecting a sulphide lode, the "Sprague vein," on Land Lot 47, 4th District, about five miles northwest of Cleveland, and saprolite deposits on the lots adjoining to the southwest. A shaft was sunk on the lode to a depth of 50 feet and a small stamp-mill erected, but the work has been temporarily halted by a sudden inflow of water, probably from the old workings on the adjoining Blake property.

FORSYTH COUNTY

A small area of placer ground about 2 miles east of Cumming, leased from Dr. Mashburn, of that town, has been operated for some time. The material is washed down by a hydraulic giant. *This work stopped in October due to disagreement among the leasees.* This property illustrates a feature common to most of the placers in the gold belt. The richer gravel lies in lenticular channels next to the decomposed bedrock.

PAULDING COUNTY

Present mining activity in Paulding County is largely confined to the Burnt Hickory Ridge district, about halfway between Cartersville and Dallas. In addition to the usual small-scale sluice-box mining, the Old Twillery mine is being worked by shallow trenching in the saprolite of the lode that passes through the property. The ore is treated in a small ball mill. *The placer and saprolite deposits of the old Yorkville mine, about two and a half miles east of Yorkville, are now being prospected under the direction of Mr. J. Sproul Colbert.*

McDUFFIE COUNTY

McDuffie County has had several important mines in past years, but at present the only activity, aside from haphazard "gopherring" by local farmers and landowners, is confined to the property of Mr. W. H. Fluker, about 12 miles northwest of Thomson, adjacent to the Little River. A quartz vein has been opened by a shallow shaft. The ore is treated in a small stamp mill.

On the Fluker property and distributed over adjacent areas are several mines which have been producers in the past. These include the Columbia, Park, Hamilton, and Seminole or McGruder mines. All these properties have been abandoned for several years, some of them for many years, and any determination of their future possibilities would require careful examination of the old workings, which are now inaccessible.

The geologic features and character of mineralization in McDuffie County are in general similar to those in other parts of the gold belt, but this area shows a more pronounced development of the veins.

The reader who is interested in further details should write to the State Geologist in Atlanta. Bulletins 4-A and 19 of the Georgia Geological Survey (now out of print but available at many public libraries) give descriptions of all the properties of any past importance in the gold belt. Valuable information relative to methods of placer mining, lode mining, milling of gold ores, etc., can be obtained by writing to the Director of the United States Bureau of Mines at Washington, D. C.

FROM A GEOLOGIST'S NOTEBOOK

Thompson, Weinman & Co., Inc., of Cartersville, Georgia, have recently established a research laboratory in Cambridge,

Mass. Mr. A. R. Lukens, Director of Research, states that the express purpose of the laboratory is "to spread the use of mineral products which largely come from Georgia." Thompson, Weinman & Co. mine for various uses limestone, clay, mica, talc, and barytes.

A collection of 67 gold nuggets recovered last fall in Duke's Creek in White County, has been on display at the State Capitol for the past month. This exhibit was made through the courtesy of Mr. W. C. Hudson, owner of the W. C. Hudson Gold Mine. Mr. Hudson has recovered a large number of small nuggets during his operations, the largest of which was sent recently to the Harvard Museum. Widespread publicity has been attached to his discoveries.

Mr. H. P. Stuckey, Director of the Georgia Experiment Station, reveals, in answer to an inquiry from State Geologist R. W. Smith, that a marl high in lime content can be used for correcting soil acidity where it can be gotten for little expense. Assistant Geologist Lane Mitchell recently visited marl deposits in the Coastal Plain. Mr. Stuckey states, however, that the Department of Agronomy feels that dolomitic limestone is preferable for the Piedmont section of Georgia since it contains magnesium and seems to work well for correcting the acidity of certain well-known fertilizers. Dolomitic limestone is at present produced in Bartow, Gilmer and Pickens counties and might possibly be produced elsewhere.

A light earthquake which was reported from Young Harris on January 1 of this year was found by Assistant Geologist G. W. Crickmay to extend over a large area in Georgia and North Carolina. The epicentral area was believed to have been in the Shooting Creek area of North Carolina and Georgia. Tremors were felt from Ellijay to Cleveland in Georgia and at numerous points in North Carolina, including Murphy, Bryson City, Asheville, Brevard, and Franklin.

NEWLY DISCOVERED KYANITE

Previously unrecorded deposits of kyanite have just been located in Talbot, Upson and Fulton counties by G. W. Crickmay, Assistant State Geologist. These deposits have possible commercial value in the manufacture of high temperature refractories, such as fire brick and boiler patching. The mineral has recently been the subject of an extensive investigation by the U. S. Geological Survey with the cooperation of the Georgia Division of Geology. Coming on the heels of the recent government investigation which revealed large occurrences in the North Georgia counties of Towns, Union, Fannin, Gilmer, Pickens, and Cherokee, Mr. Crickmay's announcement reveals a wide distribution over the

northern part of the State. The Talbot county deposits were found in a small valley a quarter mile south of Woodland.

The kyanite was found in quartz veins, in pagnetite, and in the adjoining schists. Similar occurrences near Thomaston in Upson county were also investigated. Acting on information supplied by a student of North Fulton High School to a science teacher, the State Geological Survey also investigated a rather extensive surface occurrence of the mineral near Dunwoody in Fulton county.

INCREASE GOLD MINING NOTED IN GEORGIA

The value of gold mined in Georgia is rapidly increasing, and was greater in 1933 than for any year since 1917, according to an information circular entitled "Gold Deposits of Georgia," put out by the Division of Geology of Georgia, to report the results of recent investigations made by Roy A. Wilson, of the U. S. Geological Survey.

Information on gold production 1830 to 1933, given in the circular, shows that the total value of gold obtained in Georgia is \$17,735,972. State Geologist Richard W. Smith says that production figures for 1934 have not yet been obtained, but from evidence at hand, the output of gold in Georgia will be considerably greater than for 1933.

The information circular reproduces articles which have appeared in the Forestry Geological Review, with one additional article contributed by Mr. Wilson and with additional information by State Geologist Smith.

According to a map locating gold deposits in Georgia, the main gold bearing formations are found in two distinct strips, one extending from Rabun county in northeast Georgia southwestward into Haralson and Carroll counties on the western border of the state. The other main formation extends from Rabun to Fulton county, with slight occurrences in Douglas.

These two main leads are found in Rabun, White, Lumpkin, Habersham, Hall, Dawson, Cherokee, Gwinnett, Forsyth, Bartow, Cobb, Paulding, Haralson, Fulton, Douglas and Carroll counties.

Gold deposits are also reported in Columbia, McDuffie, Lincoln, Wilkes, Greene, Oglethorpe, Elbert, Madison, Hart, Walton, Newton, Henry, Coweta, Towns, Union, Fannin, Gilmer, and Murray counties.

Present mining activities reported in the circular are in Lumpkin county, in which there are seven main operations; in White county, in which there are three operations; Forsyth county, one; Paulding, small operations in Burnt Hickory Ridge district; McDuffie, several small operations aside from the Fluker mine, about 12 miles north of Thomson.

The state geologist announces that the circular on gold in Georgia can be obtained free on request by anyone interested in gold production.

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CARELESSNESS WITH FIRES BRINGS FOREST DEVASTATION

**Spring Gloomy with Pall of Smoke
—Tree Seedlings Wiped Out—
Large Trees Seared and Weakened—
Damage Millions of Dollars**

Spring is the forest fire season in Georgia, a time when a pall of smoke from many forest fires spreads gloom over the landscape; when crackling fires race through the forests, killing seedlings, searing and stunting larger trees; driving out game; doing violence to nature that estimated in money values reaches millions of dollars in Georgia; leaving blackened wastes where resurgent spring was expressing beauty and fullness of life.

And yet there is noted in the forest fire reports, that the origin of many of these burnings is "incendiary"; that is, they have been purposely started and allowed to burn at will.

What kind of thinking is the incendiary doing? Certainly he is not thinking of the welfare of the forests. No one can be so stupid as to think that burning will help the woods. No, his thinking, in some instances, is that burning off the dead grasses of last season will "green up" the woods pasture earlier, so that the winter starved, roving cattle can begin to cover their bones with flesh. But the grass does not come earlier because of the fire. It merely becomes visible more quickly. From the cattleman's viewpoint, were he to think rightly, he would observe that the fire has killed out the better grazing grasses and has left only the poorest, the tuft grasses like sedge and wire grass.

Whose cattle are they for which the burning is done? In many cases they do not belong to the owner of the land. They belong to men who consider anybody's forests as public range, and in line with their perverted type of thinking they burn off the other man's forest to "improve", as they think, the grazing.

Then there are still a good many who think forest fires will destroy insects that damage crops and livestock. Wrong thinking again. Anyone who has taken the time to consider his own experience will realize that in spite of fires the insects are still with him. He should, therefore, realize, even if unwilling to take the word of those who

do know, that forest fires do not eradicate these harmful insects.

In the spring, when farmers are cleaning up old stalks and debris from their fields, instead of putting it in gullies and on worn spots of the land, they follow an old custom of burning it. Through carelessness the debris fires are allowed to spread, enter the forest and very often burn their way unhindered.

The forest area burned over annually in Georgia may appear to indicate that the sentiment against burning off the woods is not growing, but this is an error. More people are opposed to woods burning in Georgia, and more people are fighting fire than ever before. In fact, a very small percentage of the population is composed of wilful forest burners. The damage this few can do is far out of proportion to their number. A few chaingang sentences will have more influence on this few than all the education that could be heaped upon them. They are impervious to education, but not to the lessons of a chaingang sentence.

FOREST FIRE RECORD FOR GEORGIA, 1934

An improvement in forest fire protection is noted for 1934 as compared to the year 1933, especially on areas belonging to Timber Protective Organizations. While the number of fires was greater, the percentage of T. P. O. acreage burned over was very much less. In 1933 it was unusually high because of dry weather, high winds and sweeping fires. The percentage was 11, but in 1934, when conditions were not so bad and CCC fire fighters had gained greater efficiency, the area burned over was only .08 per cent.

The area under T. P. O. management in 1934 was 4,304,312 acres; the number of fires 1,711; the acres burned over 345,409; the damage \$413,571.

On unprotected forest land the number of fires is placed at 24,050; the acreage burned 5,124,000 and the estimated damage is placed at \$2,640,700.

All told there were 25,761 fires in Georgia doing damage to the extent of about \$3,000,000.

Fisherman: "I tell you, it was that long! I never saw such a fish!"

Friend: "I believe you."

TREE PLANTING TIME TIMBER CROPS FOR FUTURE

**Growing Interest in Giving Trees a
Chance to Utilize Abandoned and
Eroding Land — Nursery Seedlings
Short of Demand — Wild
Seedlings Worth While**

February and March are the months for planting tree seedlings. Future tree crops depend on seedlings that get a start this year. When planted and properly spaced, trees will grow more rapidly than when natural reproduction does the job. Everybody wants trees to grow rapidly and grow where seed trees cannot plant them. Moreover, there is an incentive to plant that did not formerly exist, that is, the certain demand for southern pines at future paper mills. There is a promise that pines will yield a profit from land now yielding nothing. No wonder there is an urge to plant trees in the south, and a realization that the sooner the planting the sooner there will be a tree harvest.

It is true that the tree nurseries have sold out—sold before a fraction of the demand was met.

What then can the land owner plant this season? The answer is wild stock. Along the edges of the forest and in open spaces in the forest are one or two year old seedlings. Spade them up carefully and transplant them where trees are wanted. If the root system of the seedlings is kept intact and the plants put in a bucket of water to keep the roots from drying out till they are planted, a good survival will result. No, they are not as good as nursery grown seedlings, but they are better than nothing and some fine plantations have been grown from wild stock.

Not a few farmers of Georgia are reported planting tree seed direct to the land where they are to grow. Experience has shown that this is not a safe method. Birds and field mice get the seed before they can grow. Yet, with good luck, a fair stand may be expected from "spot" planting of tree seed.

Since the demand for tree planting stock is growing by leaps and bounds, more than usual interest is shown in establishing tree seed beds. The rural consolidated schools having vocational agricultural teachers are this year showing greater interest than ever in establishing tree seed beds in an effort to

FORESTRY QUESTION BOX

Would it be profitable to chip red gum trees at 60 cents per pound for gum?

The price is too low to make chipping of red gum profitable. Formerly, when gum brought \$1.50 or more per pound, it was well worth while to work the trees. It is preferable to chip the red gum just before the tree is to be cut and sold for lumber or veneer.

How soon will southern pines grow to pulpwood size, is asked by a northern man studying the paper manufacturing possibilities of the south? He also asks if the paper industry will conflict with the naval stores industry.

Where slash pines have been planted in old fields, spaced properly and protected from fire, they have grown to pulpwood size (4 inch diameter) in 5 to 7 years. No one would, however, recommend cutting trees for pulpwood at this age, except for thinning purposes, for the reason that they are making their most rapid growth of commercial wood at that time.

Since the paper industry would provide a market for thinnings, an incentive would thereby be provided for thinning to stimulate more rapid growth of the remaining trees. Thinning is greatly needed for promoting profitable gum production for the naval stores industry. Therefore, the paper mill can be made a factor in developing naval stores production.

Anyone who grows slash and longleaf pine in the southeast, where a ready market for pine gum is afforded, would be foolish if he did not get his best paying crop—gum—from his pines, especially since he can sell the wood after the chipping is completed as pulpwood, poles, sawlogs, etc.

Can the U. S. Forest Service be changed from the U. S. Department of Agriculture to another department without Congressional action?

Yes, Congress has given the President power to reorganize the departments. Such a proposed change has been widely protested and apparently has little or no popular support.

Is the Osage orange tree of commercial value?

An important product of the Osage orange tree is a dye which has supplanted imports formerly coming from Jamaica. The wood of the tree lends itself to the manufacture of small articles.

Work faithfully eight hours a day, and don't worry. Then, in time, you may become the boss and work 12 hours a day and do all the worrying.

FIRST DISTRICT

Russell Franklin, Dist. Forester
Rome

Lookout Mountain TPO

The Lookout Mountain TPO has recently employed four men to patrol the 376,228 acres of forest land now signed up in this TPO. The area has been divided into units and each patrolman has one unit to cover. The national park service has agreed to assist the TPO in fire suppression work by allowing men from two CCC camps located just across the line in Tennessee to come in this area and fight fires when called upon by the patrolmen.

Community Offers Cooperation

The people of Naomi community of Walker county signified willingness to cooperate in the county-wide fire protection system by organizing into a local unit of Forest Fire Fighters and have agreed to fight any fires occurring in their community, and to contact all the people in the community in an effort to do actual presuppression work. Mr. J. F. Cobb, vocational teacher, was instrumental in organizing this community and now plans on doing the same thing in the west section of Walker county in the Cedar Grove community.

Ask For Indictment of Woods' Burners

Mr. J. N. Young, Sr., of Walker county, appeared before the Walker county grand jury in the interest of forestry. Mr. Young stressed the value of the timber now standing in Walker county, and the harm that fires do to the young timber as well as the old. He asked the grand jury to include in its presentments a statement to the effect that it would indict anyone caught maliciously setting fire in Walker county. Judge Porter has already signified his willingness to "burn up" anyone convicted before him.

SECOND DISTRICT

W. D. Young, Dist. Forester,
Gainesville

White County May Organize TPO

County Agent Huff and Mr. J. P. Davison, of Cleveland, are now attempting to arrange a meeting of the landowners of White county to organize into a county wide TPO. Several prominent landowners have expressed their interest and it is hoped that this TPO will soon be operating. A meeting was called on the 22nd of February when the initial 10,000 or more acres were signed up, and officers elected.

Dawson County Organizes TPO

A meeting was held at the court house on Saturday, February 16, where several landowners of the county gathered and or-

ganized the Dawson county TPO. It is planned to make this organization county wide. 11,000 acres were signed up at the meeting. The officers of the organization made the assessment per acre 3 cents, believing the amount ample to handle all protective expenses.

Another meeting is to be held Saturday afternoon, February 23, at the court house where it is hoped that a large crowd will be present.

Relative to Mr. Wallace's Article

The article appearing in the Review of February "Planting Pines—a Hobby", was very good, however there is one angle that was not covered which I am taking the liberty to do.

Every farmer attempts to grow a crop each year with the expectation of realizing some profit. He puts in long hours, money and worry to do it, not only that, but a large part of his income from the preceding year is put back into the soil to grow another crop. If our climatic conditions were such that food could be gathered off of trees as it is secured in some of the tropical countries, there would be little incentive needed or work to encourage growing food crops. In other words, the incentive is to grow food as a necessity to live and a hope of securing a profit from the venture also. It entails expense, worry and hard work. Knowing the cost, every farmer makes efforts to take care of the crop in the growing season.

If this principal could be instilled in the minds of every farmer and landowner in the growing of trees, the educational value would be very great.

A large percent of farmers and landowners do not consider natural reproduction of trees very valuable, simply for the reason that they do not see the value in dollars and cents.

If every landowner can be induced to plant and grow forest seedlings, for a hobby or for any other reason, the fact that he went to the expense of purchasing or growing the seedlings and planting them, will insure his caring for them and his interest until they reach a size to be used.

The planting and care of one or two acres or many acres, will develop the protection idea in the mind of the owner and will by example and neighborly interest aid in the ultimate goal of state wide protection of growing forests.

THIRD DISTRICT

C. N. Elliott, District Forester
Augusta

Active Patrolman

C. W. Johnson has been appointed patrolman of the Woodville TPO to succeed Robert I. Calloway. Mr. Johnson is a native of Woodville. He made an excellent beginning during the first ten days of Febru-

ary, when he collected his crews and extinguished five forest fires, three of them extending over several hundred acres. One of the largest TPO meetings held in Woodville was early in February, when Mr. Johnson was heartily endorsed for the position of patrolman. Mr. R. R. Shaw is president of the organization.

Plantings on Stephen's Park

Since the tenth of December, the camp at Crawfordville has planted approximately fifteen thousand trees on the Alexander Stephens memorial park. These trees were transplanted from the woods. They range in size from seedlings of twelve inches to fifteen feet in height. They were planted in abandoned fields, to cover up drain ditches, and around dwellings of the park. Many species were transplanted, including Cypress, Black Walnut, Red Cedar, Carolina Cherry, Dogwood, Red Haw, Crabapple, and others. Mr. Taylor, Wild Life authority with the National Park Service, from Richmond, Va., was exceedingly well pleased with the planting. He advised that such trees would provide natural food and cover and increase the bird and animal life on the area.

Tree Planting on State Hospital Farm

Approximately twelve thousand seedlings were gathered and transplanted by the planting crew of the CCC side camp at Milledgeville. This planting was done on abandoned hillsides, in an effort to check erosion on the steep, barren hillsides of the State Hospital farm land.

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Like to Gamble?

Artificial reforestation of abandoned fields by direct seeding with longleaf pine seed has taken a sudden spurt in Taylor county. Whether or not it will prove generally successful is yet to be seen. It all started from a successful direct seeding with longleaf seed, by the spot method, of 100 acres of abandoned field in the winter of 1932, by Mr. T. J. Fountain, Reynolds, Ga. Mr. Fountain secured a practically perfect stand of longleaf pine which is now beginning its fourth year and has started good height growth.

A total of approximately 200 acres of abandoned fields have been planted this winter by several landowners, using the spot method of direct seeding practiced by Mr. Fountain. The district forester is inclined to look on this method of artificial reforestation with some favor and much interest, but with reservations until its practicality is proven. It is entirely possible that the spot method of direct seeding will prove generally successful when practiced on old fields relatively clear of scrub growth, and provid-

ing the soil is of a loose, sandy type. The fields can be cultivated for possibly three or four seasons provided the crops do not shade the pines too much or otherwise hinder their growth. This practice also lessens fire hazard.

Best observations, so far, are that the seeding should be done early, January or preferably sooner. Planting spots should be prepared at the desired spacing on level, or better, slightly raised hills, such as old corn and cotton rows. Plant several seed to each hill and barely cover the seed with soil. A light mulch of pine straw may be added if desired, which may or may not add to the success of the planting.

If you attempt direct seeding, do so in the spirit of a gamble. It is cheaper than planting seedlings, and initial growth seems to be faster. If successful, you have won a stand at a cheaper cost; if unsuccessful, you have lost the cheaper cost (of direct seeding) and a year before you can attempt another gamble or the better choice of planting one year old nursery grown seedlings.

SIXTH DISTRICT

Jack Thurmond, Dist. Forester
Savannah

T. P. O.'s to Consolidate

If present plans are perfected which seem likely, the Ocmulgee, Dodge and Little River Timber Protective Organizations will become one T. P. O. and will operate under the name of Big Ocmulgee T. P. O.

Members and officers of the three T. P. O.'s have decided that it would be best and the organization would be stronger if they united into one organization which would bring the total acreage to about 160,000 acres.

The T. P. O. will hire a full time secretary and he will collect the assessments, make up all reports and keep the records on all expenditures.

In addition to a full time secretary, the T. P. O. will be covered by a five tower detection system and have some 100 miles of telephone line in the system, extending over the whole territory. Three tower sites have already been located and approved. The other two are still pending.

Meeting at Soperton

At a meeting held on February 15 in Soperton, Ga., at the home of Mr. James Fowler, plans and means were discussed to consolidate the Treutlen and Oconee T. P. Os, which include lands in Treutlen, Laurens, Toombs and Montgomery counties.

The meeting was held in the beautiful new home of Mr. James Fowler and the Soperton Lions Club, of which Mr. Fowler is a member, sponsored the meeting.

Members of the Soperton Lions Club, members, officials and interested parties of the Oconee and Treutlen Timber Protective

Organizations were present and enjoyed a most delicious quail dinner given by Mr. Fowler. Several interesting talks were made by members of the Lions Club and TPO officials, concerning forest fire protection and problems and consolidation of the T. P. O.'s and the hiring of a full time secretary was strongly urged. At a later meeting this will be carried out.

State Forester B. M. Lufburrow was the guest speaker and outlined in a most thorough and interesting way the formation, growth and work of the Emergency Conservation Work program, as applied to private lands which are cooperating with the Forest Service in fire protection work.

Everyone present at the meeting was very enthusiastic over the enlargement and consolidation of the two existing T. P. O.'s.

Emanuel T. P. O.

Three tower sites have been located in Emanuel county on which the three 100 ft. steel lookout towers the TPO bought will be erected.

Approximately fifty miles of forest service telephone lines will be erected that will tie in with the existing privately owned lines and give adequate telephone facilities for the county wide detection system, that will result when the three towers are completed. The three towers will cover 225,000 acres of forest land in Emanuel county.

J. B. Lattay Transferred

Mr. J. B. Lattay, E. C. W. Forester in the Savannah district for the past 16 months, has been transferred to the Waycross district.

The Savannah district certainly suffered a loss when Mr. Lattay left, as he was a most efficient and earnest worker, looking to the best interests of the service at all times.

We trust Mr. Lattay will be back with us in the very near future.

EIGHTH DISTRICT

H. D. Story, Jr., Dist. Forester
Albany

Tree Nursery Notes

Beds have been prepared and planting started at the South Ga. Nursery located at Albany and planting is expected to be completed by the first of March.

Mr. Murphy, Nurseryman in charge, has been successful in producing a large percent in number one seedlings from the small amount of seed available for planting last year and by prorating orders was able to supply almost every one that applied with a portion of their order for transplanting.

Due to the good seed crop Mr. Murphy plans to plant more seedlings for 1935-36 delivery than has ever been produced from the South Georgia Nursery.

It is apparent from the number of orders

already being filed for 1935-36 delivery that a great demand is going to be made upon the nursery to supply the land owners of our state who are realizing the advantages in putting their idle acres to work.

Rotary Club Sponsors Fire Campaign

Starting February 4 a series of motion pictures were given in Early county in connection with an Educational drive sponsored by the Blakely Rotary Club for the Prevention of Forest Fires. Films obtained from the U. S. Forest Service were shown and interest was widely aroused. Early County, one of the best timber producing counties of the south, has been overrun by fires and a large amount of the young growth killed out. The Blakely Rotary Club is endeavoring to show the people the folly of woods burning, the vast amount of natural resources that they have in their timber, and how their forests are rapidly dwindling away due to the destruction of young growth caused by forest fires.

Mr. Raymond Singletary, Jr., Chairman of the Educational Program, is greatly interested in the work and plans to organize a Timber Protective Organization if this program goes over successfully.

NICKNAMES OF DISTRICT FORESTERS

Hear ye! Know all district foresters by these nicknames.

W. G. Wallace, Columbus, Ga. "Hun"
—his wife.
C. B. Beale, Waycross, Ga. "Mr. Bell"
R. D. Franklin, Rome, Ga. "Rusty"
W. D. Young, Gainesville, Ga. "Brigham"
H. D. Story, Albany, Ga. "True"
C. N. Elliott, Augusta, Ga. "Hoot"
Jack Thurmond, Savannah, Ga. "Ned"

SEASONING OF SOUTHERN SWAMP OAKS

Successful work was recently done at the U. S. Forest Products Laboratory in the drying of southern swamp oaks, hitherto considered impossible of satisfactory seasoning because of their excessive checking, honeycombing, and warping. The method used was steeping in brine, followed by a high temperature and low-humidity schedule in the dry kiln. By this means one-inch boards of swamp oak were processed and dried in two weeks to a moisture content as low as 5 percent, with no checking and with less shrinkage than when seasoned by ordinary methods.

Before the advent of the white man, there were some 822,000,000 acres of forest land in this country, according to figures compiled by the American Tree Association. Today that has been reduced to 99,000,000 acres of original timberland and 313,000,000 acres of second growth timber.

Detour: The roughest distance between two points.

JUNIOR FIRE WARDENS USED IN CANADA

School Boys Organized for Forest and Game Protection. — Patrol Forests in Spare Time.

MONTREAL, (UP).—Scattered throughout the wooded area of the Dominion, 13,000 school children are playing an important part in protecting Canada's forest wealth from one of its greatest dangers—fire.

Carefully selected and continuously encouraged in their duties as conservators and students of conservation, the youths are a nucleus of a coming army of boys lending a hand to safeguard forests and wild life.

The boys are known as "junior forest wardens." They are being organized into patrols by the Canadian Forestry Association as part of a widespread campaign to arouse public interest in protecting one of the country's most important sources of natural wealth.

There are 4,000 junior forest wardens in British Columbia alone. In eastern Canada there are 2,000. Nearly 3,000 schools are working in active cooperation with the association.

The duties of the youths are to patrol the forests in their spare time and report all fires and desecration of woods. The work is done voluntarily.

BORAX TREATMENT FOR STAIN AND DECAY CONTROL

Hardwood operators who experience any special difficulty in controlling decay beneath the crossers in their seasoning piles may find it worth while to try mixing borax in with their dipping treatment, or even to use borax alone. A 4 percent solution of borax has not only been found to be a good sap-stain preventive, but small-scale tests with bulk-piled sap gum indicate that surface treatments with this material are more effective in preventing decay for short periods than any of the hardwood dipping treatments now widely used.—Southern Forest Experiment Station.

Song of the Open Road

I think that I shall never see
A billboard lovely as a tree.
Perhaps, unless the billboards fall,
I'll never see a tree at all.
—Ogden Nash, in the New Yorker.

Palm trees cannot be cut into boards as the outside is too hard and the inside too soft.

Gas Station Attendant: "How's your oil?"
Negro Motorist: "Ah's fine. How's yo' all?"

SCHOOL FOREST WORK MAKES RAPID PROGRESS

New Vocational Agricultural Teachers Secure School Forests. Establish Tree Seed Beds and Plant Seedlings.

Georgia now has 192 rural consolidated schools with vocational agricultural teachers. Of these, 50 are new and are introducing agriculture into their courses for the first time. Forestry is a part of the agricultural course. In keeping with the practice of teaching agriculture by the job method in these schools, forestry is likewise taught by the job method.

To meet this requirement, each school is required to have a school forest of approximately 10 acres and an area on which to practice tree planting. The school forests are surveyed by a representative of the Georgia Forest Service who also makes management plans for the forest and each school year conducts two or three demonstrations on the tract.

Most of the new vocational agricultural teachers have been able to obtain school forests and are proceeding to carry on the project. More than the usual number of old schools, as well as new, have established tree seed beds and are preparing to grow seedlings, not only for school planting, but to help meet the community demand for planting stock.

Tree tags have been provided all schools with new forests. On quarter-acre sample plots each tree is given a number. Various treatments are given these plots to note their effect on the rate of growth. This is determined by annual diameter measurements. These studies show the effect of fire thinning, improvement cutting and pruning. Most of the plots are designed to show the effect of fire on the rate of tree growth.

A certain amount of thinning each year is required, beginning with the sample plots. This work is to be completed before March 15, beyond which time no cutting is recommended until the next dormant period.

Planting is well under way with the intention of completing this job by March 15.

CCC Boys Gain Weight

Robert Fechner, Director of Emergency Conservation Work, today announced that a recent survey conducted by the Office of the Surgeon General of the War Department indicated that the average young man who enrolls in the Civilian Conservation Corps gains from seven to eleven pounds during his first two months in camp.

In the Fourth Corps Area, which include North Carolina, Tennessee, South Carolina, Georgia, Florida, Alabama, Mississippi and Louisiana, the men tested showed an average gain of 3.60 pounds during the first month and 2.17 pounds during the second month, making an aggregate gain of 5.77 pounds.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

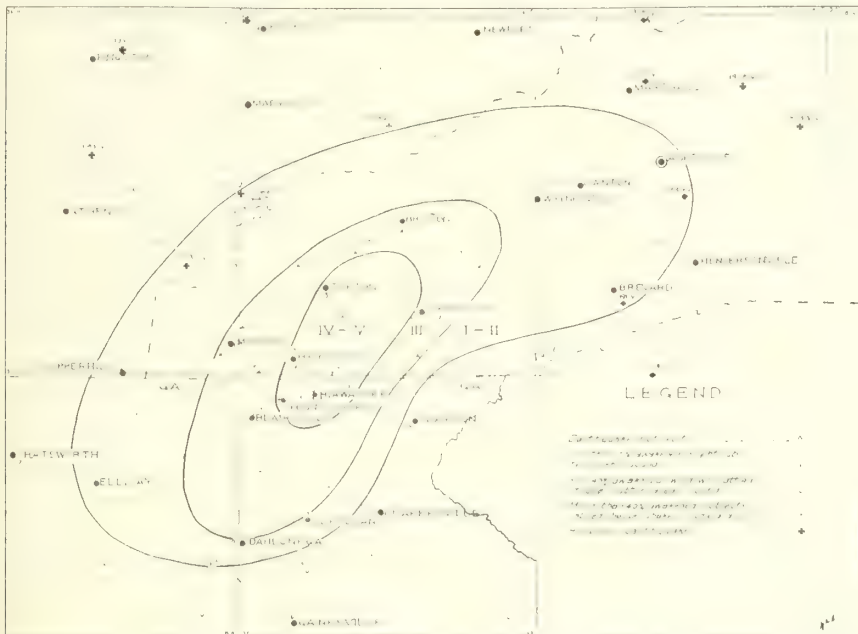
Reported by THE DIVISION OF GEOLOGY

EARTHQUAKES IN GEORGIA

Geoffrey W. Crickmay and Lane Mitchell

According to popular fancy there is nothing more firm and solid than the ground on which we stand or the earth foundations on which we build. In a world that is undergoing continual political and economic change, *Terra Firma* remains to many minds the epitome of stability. Yet the earth is not stable. During the vast eras of geologic time the earth has undergone greater upheavals and severer changes than any that history records. To the geologist the earth is actually mobile; to him earthquakes and volcanic eruptions are but the surface signs of this mobility. He draws a picture of an earth far different from the one we now know; an earth at one time with ice caps

Although disastrous earthquakes are fortunately rare, hardly a day goes by without minor tremors being felt somewhere in the world. The records of the U. S. Coast and Geodetic Survey and similar organizations in other countries show that earthquakes are particularly abundant in certain zones, such as along the Pacific coast. These zones appear to be mobile parts of the earth where movement may readily take place along breaks or flaws in the crust which are known as faults. Most earthquakes are due to slipping along faults as a result of stresses in the earth's crust. Generally the movement is small but it is sufficient to start earthquake waves much as the musician's bow starts sound waves when moved across the strings of a violin. Three types of waves have been recognized. Two of these



Map of the Southern Appalachian earthquake of January 1, 1935, showing intensities based on reports obtained by interview (upright figures), by correspondence (oblique figures), and by the U. S. Coast and Geodetic Survey (underlined figures). Roman figures indicate intensity according to the Wood-Newman scale. All previous earthquakes in the area are shown, with their date and intensity.

covering many of the continents, at earlier times with inland seas where now stand the great mountain chains of the world, and with intercontinental land-bridges which have sunk into the ocean depths. But such conditions as these are far removed from our everyday life. To us there is nothing that a temperamental Nature brings more sudden, more devastating, or more inescapable than the disaster of an earthquake. These paroxysms demolish the foundations upon which we have built and in their wake leave only tragedy and ruin. The stable earth is no longer stable. *Terra Firma* is no longer firm.

take a direct path through the earth from their source to distant points, but as they travel at different speeds they arrive at different times. The third type travels more slowly along the surface. A very sensitive instrument, the seismograph, has been devised to record these waves in such a way that the expert can distinguish each type and thus determine the distance and direction to their source.

Seismographic stations are unfortunately few and far between and a great deal of information must be obtained through questionnaires—using the inhabitants and artificial structures in the area affected as re-

cording instruments. It is for this reason that the intensity of an earthquake is measured in terms of human reactions and effect on buildings. The Wood-Newmann scale, now used by the U. S. Coast and Geodetic Survey, ranges from an intensity of I, a tremor felt by very few people under especially favorable circumstances, to XII, a shock strong enough to demolish all buildings, start panic amongst the inhabitants, break underground pipes, and even throw objects up into the air. The slow surface waves may actually be seen and may be indelibly preserved in the contortions of railway tracks. An earthquake of intermediate intensity, VI in the scale, is felt by everyone, many are frightened and run outdoors, in a few cases plaster falls from ceilings and bricks from chimneys but there is generally slight damage to buildings.

Georgia is happily situated outside of any recognized earthquake zone and no serious shocks are likely to occur. The State has felt a number of tremors that originated outside its borders, especially the New Madrid of 1811, and the Charleston of 1886. The New Madrid earthquake, the greatest that has ever occurred on this continent, originated in a then very sparsely settled section of the Mississippi Valley and was distinctly felt over an area of more than a million square miles. The Charleston earthquake was felt from Canada to Cuba and as far east as Bermuda. In the central Appalachian area the tremors were felt less distinctly than at some more distant points. Such "shadow zones" are recognized in many earthquakes. Several earthquakes in the Appalachian region of Tennessee and North Carolina, and in the Coastal Plain area of South Carolina and Alabama have been felt in Georgia. The State can expect to feel such mild tremors in the future but it will remain with Florida amongst the least seismic of all the states.

The following is a brief resume from the reports of the U. S. Coast and Geodetic Survey of the seven earthquakes known to have originated in Georgia.

- 1872, June 17.—Milledgeville. Sharp shock; brick buildings jarred and windows rattled.
- 1875, November 1.—Northeast part of state. Felt from Spartanburg and Columbia, S. C., to Atlanta and Macon, Ga., and from Gainesville to Augusta, an area of approximately 30,000 square miles.
- 1902, October 18. Dalton. Felt over most of northwest Georgia and adjacent parts of Alabama and Tennessee.
- 1903, Jan. 23.—Felt at Tybee Island, Savannah with intensity VI; houses strongly shaken.
- 1912, June 20. A shock felt strongly at Savannah.
- 1914, March 5.—Center was 30 miles southeast of Atlanta. Intensity VI. It was felt in western North Carolina as far east as Cherokee county, and in Alabama and Tennessee. Total area about 95,000 square miles.

1928, May 23.—Valdosta. An apparent seismic tremor which was preceded by the passing of a large meteor.

The most recent earthquake recorded in Georgia occurred near Shooting Creek, Clay County, N. C., at 3:15 A. M., Jan. 1, 1935. Investigation by the Division of Geology showed that it was felt in Towns, Union, Fannin, Gilmer, Lumpkin, and White counties, Georgia. It was felt as far north as Asheville, N. C. and from Brevard, N. C. to Ducktown, Tenn. The total area affected was 6,725 square miles. The area of greatest intensity, known as the epicentral region, lay between Tipton, N. C. and Hiawassee, Ga., and occupied 549 square miles.

In the epicentral area the intensity reached V in terms of the Wood-Newmann scale. More than 40% of the inhabitants were awakened by rattling of window panes and other loose objects. Alarm was felt by a few people in Towns County, Georgia and Clay County, North Carolina. The shock, however, lasted only a minute and a half and most of the people, as they put it, "had no time to get scared". In the Shooting Creek district one man was nearly thrown from his bed.

As far as has been determined, the earthquake did no serious damage. Members of the C. C. C. camp at Tipton, N. C., were awakened by the rumbling noise. The roof of the bathroom was toppled over and part of the stove was dislodged. At Shooting Creek a window pane was shaken from its frame and at Franklin, N. C., garments on display stands in a store window were overturned. Many people felt the vibration of beds and in a few cases even the entire house was shaken.

There are no seismographic records of the earthquake due in part to the fact that no such instruments have been installed in Georgia. The shock should have been recorded on seismographs at Columbia, S. C., Charlottesville, Va., and Washington, D. C., but all these instruments were disturbed at the time by unusually abundant microseismic shocks, those small tremors occurring everyday of the year but only registered by seismographs.

The geologic conditions which caused the earthquake are not known. The epicenter lies in a mountainous and sparsely populated section underlain by very old rocks. It seems reasonable to suppose that movement occurred along some unrecognized fault, probably deep below the ground surface.

The purpose of earthquake investigation is two-fold; economic and scientific. Economically it would be advantageous to know exactly where earthquakes are likely to occur and to know their effect on buildings of various design. It would be suicidal to build the sky scrapers of New York near an active fault zone. The character of earthquake waves that travel through the earth tell the scientist much about the nature of that inaccessible region. A great deal of geologic theory has been built up around the type of movement involved in earthquakes

and the distribution of the earthquake zones.

The public can render invaluable assistance in such investigations by keeping an accurate record of events during an earthquake. It is important to know the exact time, number of shocks, duration of shocks, character of surface and subterranean sounds, direction of motion of any moveable objects, and the personal reactions of people in the neighborhood. Such information should be sent to the State Geologist.

GEORGIA MINERAL SOCIETY NEW ORGANIZATION FORMED

The Georgia Mineral Society came into being Monday night, February 11, 1935, as mineralogists, amateur gem and mineral collectors, and geologists met at the Central Y. M. C. A. The avowed purpose of the new organization is to promote interest in a study and discussion of minerals by means of lectures, papers, field trips, and exhibits.

Dr. Frank Daniel, of Atlanta, was chosen as temporary chairman and Joe Porterfield, of Royston as temporary secretary, pending the completion of organization. State Geologist Richard W. Smith and Assistant Geologist G. W. Crickmay were given important committee assignments.

Assistant Geologist Lane Mitchell led a short discussion on the occurrence of staurolite crystals in Georgia. Professor C. D. Gibson, of Georgia Tech, was chosen as speaker for the next meeting. He will talk on fluorescent minerals and will illustrate his talk with the display owned by Mr. P. H. Nelson, of Atlanta. The meeting will be held on the second Monday in March at Mr. Nelson's home. All interested are invited to be present.

Other prominent Georgians interested in the new organization are Dr. T. Poole Maynard, of Atlanta, Dr. Leon Smith, of Macon, Dr. J. O. McCrary, of Royston.

January Publications of the U. S. Bureau of Mines That May Be Of Interest to Georgia Mineral Producers

Publications:—Order from Supt, of Documents, Washington, D. C. Send cash or money order, stamps not accepted.

Reprints from Minerals Yearbook, 1934: Chromite, by Robert H. Ridgeway. Pp. 465-475. 5 cents; Manganese and manganiferous ores, by Robert H. Ridgway. Pp. 399-416. 5 cents; Abrasive materials, by Oliver Bowles and A. E. Davis. Pp. 889-906. 5 cents; Mica, by F. W. Horton and B. H. Stoddard. Pp. 1057-1074. 5 cents

Periodical Service Reports: Order from Information Div., U. S. Bureau of Mines, Washington, D. C. Send cash or money order, stamps not accepted.

Cp 162. Monthly cement statement for November, 1934. 2 pp. 10 cents.

CP 163. Monthly cement statement for December, 1934. 6 pp. 10 cents.

Free Publications:—Order from Section

FROM A GEOLOGIST'S NOTEBOOK

Dr. C. F. Park, Jr., of the U. S. Geological Survey, recently arrived in Dahlonega, Ga., to continue a survey of Georgia's gold resources. He intends to study all operating properties and as many places as possible from which gold has been recovered in the past. His experience in making gold surveys portends an excellent piece of work in this new assignment. A paper by Dr. Park on the Hog Mountain, Alabama, gold field has just been released by the American Society of Mining and Metallurgical Engineers.

When invisible ultra-violet rays fall on certain minerals, a soft rich glow of various colors emanates from the specimens. This property is called fluorescence and is being made the subject of much study by mineralogists and collectors. Several Georgians have secured ultra-violet lamps for the purpose. At the next meeting of the Georgia Mineral Society Prof. C. D. Gibson, of Georgia Tech, will speak on the subject, using the display of Mr. H. P. Nelson to illustrate his talk.

A display of Georgia gem stones in the State Capitol has been attracting considerable attention. The collection includes garnet, amethyst, beryl, agate, quartz, and opal. Of particular interest are the stones cut in the past year by Dr. Frank Daniel, of Atlanta, and Joe Porterfield, of Royston, amateur lapidaries who have lent some of their stones to the State Museum. Several natural curios are displayed in the same case: Flexible sandstone, a meteorite, and the fulgurites—tubes made by lightning striking sand.

of Publications, U. S. Bureau of Mines, Washington, D. C.

Reports of Investigations:—3248. Dewatering clay suspensions by spray evaporation, by Hewitt Wilson, George A. Page, and Vance S. Cartwright. 42 pp. 25 figs.; 3263. Froth flotation of coal; sulphur and ash reduction, by H. F. Yancy and J. A. Taylor. 20 pp. 4 figs.

Information Circulars:—6814. Sand and gravel excavation—Part 2: Power Scraper, slack-line excavator, and hydraulic giant. 95 pp. 6 figs. 6816. Waste filling of stopes by Charles F. Jackson. 24 pp. 31 figs; 6817—Asbestos, General information, by Oliver Bowles. 21 pp.; 6821—Tungsten—Part I, by William O. Vanderburg. 30 pp. 1 fig.

Mineral-Market Reports:—MMS 341.—Iron ore industry in 1934—advance summary 2 pp.; MMS 342.—Manganese ore industry in 1934—advance summary. 1 p. MMS 343.—Copper industry in 1934—advance summary. 3 pp.; MMS 344.—Copper lead and zinc mining in 1934—advance summary. 3 pp.; MMS 345.—Slate industry in 1934—preliminary statistics. 3 pp.; MMS 347.—Lime industry in 1934—advance summary. 4 pp.

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No. 4

SILCOX LAUDS SOUTH FOR FORESTRY OPPORTUNITIES

Southern Pines with Numerous Products and Rapid Growth Source of Great Wealth—Speaks at Atlanta

F. A. Silcox, Chief Forester of the United States, native of Columbus, Georgia, at a luncheon March 20, tendered by President T. G. Woolford of the Georgia Forestry Association, said that southern pines with their products of naval stores, pulpwood, lumber, poles, etc., and their very rapid growth offer exceptional commercial possibilities.

Mr. Silcox had just finished a tour of southeast Georgia, where private forestry is practiced on a large and efficient scale. He spoke in praise of what he saw and said that he could see no reason for public acquisition of forest lands in that region. Private forest management, he held, is desirable and to be encouraged, but that where forest resources are neglected to the detriment of public welfare, public ownership as a last recourse, is advisable. Erosion control to conserve the soil and to lessen floods and develop water power, was emphasized, some striking examples being given of recent experience in California where, on one side of a watershed, numerous quantities of soil and boulders poured into a reservoir, whereas, on a forested slope on the other side, only clear water issued.

As the son of a cotton merchant, and from his general knowledge of cotton, Mr. Silcox said he could not work up any enthusiasm about the future of cotton, but he found it easy to be enthusiastic about the future of southern pines.

Mr. Silcox asked those interested in forestry in Georgia to be critical, to formulate plans for forestry development in the state, to let the federal forest service have an opportunity to discuss the plans to the end that there would be close cooperation in attaining the desired ends.

The forested lands of the country were not contributing their fair share to the social and economic welfare of the people. He wanted forest management for sustained yields and permanent sawmills and wood working industries, and no more of the tragic ghost towns of departed saw-

mills in cut-over and abandoned wastes.

The address of Mr. Silcox made a profound impression upon his hearers, and received cordial approval.

General George Van Horn Moseley, another one of the guests, spoke briefly, particularly of the CCC work.

FEDERAL FIRE CONTROL FUNDS INCREASED FOR GA.

Under the Clarke-McNary law, the federal allotment to Georgia for forest fire control has been increased to \$146,855, the largest sum ever made available. These funds have to be offset by state or private funds in order to become available. Georgia has never been able to match federal offers, and therefore has never obtained the full benefits of federal aid.

It now appears that the large increase in acreage of the timber protective organizations, and the interest aroused in a number of counties to employ one or more forest patrolmen, make the prospects brighter for using the full amount of federal aid.

Heretofore, practically all Clarke McNary funds have gone to members of the timber protective organizations in Georgia, on the basis of a 50 cents refund for every dollar expended on approved forest fire control measures.

In view of the fact that forest patrolmen may get half of their salaries paid from federal funds, an increasing number of the counties in Georgia, in their effort to educate the people against forest burning and to organize citizens to fight forest fires, are employing men of this type.

By reason of Georgia having the largest timber area, this state gets the largest allotment of fire control funds in the south.

FEBRUARY FOREST FIRES IN AREAS CCC CAMPS

In February there were 463 fires in areas now in charge of CCC camps, burning over an area of 57,589 acres and doing a total damage estimated at \$72,950.

The causes assigned are railroads 10, campers 1, brush burners 28, incendiary 234, naval stores burning 28, range burning 31, miscellaneous 131.

The average per fire is nearly 125 acres. The largest acreage burned over was attributed to incendiary origin, that is, burned on purpose. This area totaled 30,243 acres.

PLENTY PULP WOOD FOR NATION'S USE IN SOUTH

Federal Survey of 17,348,100 Acres in Southeast Reveals 104,734,000 Cords of Pulping Wood — Small Part of Total in South

Southeastern units of forest lands, first covered by the federal forest survey now in progress, and from which data are now available, reveal 104,794,000 cords of pulping wood on 17,348,100 acres of land. Other units extending from North Carolina to Texas inclusive are to be heard from. The first three are only a small part of the total to be reported.

The first three units referred to are located in southeast Georgia, southwest South Carolina and northern Florida. In the Georgia unit there are 44,966,000 cords; in the South Carolina unit 23,427,000 cords and in the Florida unit 45,063,000 cords.

Classified as to pines and pulping hardwoods, in the Georgia unit there are 29,703,000 cords of pine and 15,263,000 cords of hardwood; in the South Carolina unit, 12,709,000 cords of pine and 10,718,000 cords of hardwood; in the Florida unit, 29,703,000 cords of pine and 15,703,000 cords of hardwoods.

In a press dispatch from Savannah, Charles H. Herty, developer of southern pines for newsprint, says that the reports to date cover 17,348,100 acres, and that if we put the increment of growth on this acreage at only one cord per acre per year, we would have an annual production of 17,000,000 cords. This annual yield added to the 104,000,000 cords on the land, he said, it is very plain that in this surveyed area of the southeast, in which there is no paper mill, there is more than enough pulpwood to be had to supply the entire needs of the United States.

Other reports forthcoming from areas throughout the southern pine belt, of course, will reveal an enormous increase in the figures given, and will overwhelmingly refute any claim that the south is not abundantly prepared to supply the wood needed for the paper demand of this country.

Scars left on hardwood trees by the recent fires will start eating cancers.

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W. D. Young, Dist. Forester, Gainesville
C. B. Beale, District Forester, Waycross
Jack Thurmond, Dist. Forester, Savannah
C. N. Elliott, District Forester, Augusta
H. D. Story, Jr., District Forester, Albany
W. G. Wallace, District Forester, Columbus
Mrs. N. N. Edwards, Secretary, Atlanta
Mrs. R. S. Thompson, Treasurer, Atlanta

Geological Division

R. W. Smith, State Geologist, Atlanta
G. W. Crickmay, Asst. State Geologist, Atlanta
Lane Mitchell, Asst. State Geol., Atlanta
Miss Margaret Gann, Clerk, Atlanta

BEST KIND OF CUPS FOR COLLECTING GUM

Tests have been conducted by the United States Bureau of Chemistry and Soils to disclose which kind of cups are most serviceable and durable. Longleaf pines were chipped at the Naval Stores Station, Lake City, Florida, in 1933 and 1934, and the chipping will continue. The results, therefore, represent two years work.

From a statement made by the federal agencies, the following is taken:

"Clay cups collect gum that gave the highest grades of rosin recorded in the tests—from X at the beginning of the 1933 season to N at the end, and from WW at the beginning of the 1934 season to WG and N at the end. Zinc and aluminum cups of rectangular shape gave almost as good grades as the clay cups, from X at the beginning to N at the end of the 1933 season, and from WG to M at the end of the 1934 season. Rectangular galvanized iron cups gave rosin grading from X at the beginning to I and K at the end of the 1933 season and from WG to as low as G at the end of the 1934 season. No painted cup yet tested has proved satisfactory. The coatings of such cups soon cracked and wore off badly permitting the rosin to be discolored by iron which resulted in the production of K and I grades towards the end of the first season.

"Paper liners gave as low as H and I grades rosin at the end of the first season. Shellacked cups and lacquered cups were no better than galvanized iron. Bakelited cups installed during the second year gave for one year almost as good results as did the zinc and aluminum cups during the second year. Their use will be continued this year."

INTEREST IN SOUTHERN PINE FOR PULPWOOD GROWS

Paper Manufacturer in England Orders Shipment Southern Pine —Newspaper Publishers Organ- izing a Paper Plant in South

Interest in using southern pines for making newsprint paper is not abating, but has received new impetus by reason of an order for southern pulp by the Edward Lloyd Paper Manufacturing Company of London, England, reported to be the largest paper mill in the world. The company has heretofore depended largely on red spruce from Sweden and Norway.

Still further interest has been created by the determined effort of the publishers of several southern newspapers to organize a paper mill in the south to supply their needs. A successful consummation of their efforts is reported practically assured.

Other movements about which little is made public are quietly in progress, and are believed to hold promise of certain success. Southern initiative and local capital offered to help finance a paper mill, seem to promise the most immediate results.

RENFROE PLANTS BED TO SLASH PINE SEED

Marion Renfroe, Quitman, who has gained wide reputation with the remarkable results of his pine-corn plantings, is branching out in his forestal undertakings. This year he has established a seed bed of nearly an acre in which he is growing slash pine seedlings.

Representatives of the Georgia Forest Service who visited his plots in March found the bed well located on naturally moist land, and the seed beginning to sprout.

Renfroe will not undertake to grow corn again between his pines, which four seasons of growth have attained, in the case of slash pine, an average of four inches in diameter and considerable height and spread, making the ground between the rows of pines too shaded to grow a corn crop.

The area is, however, still subjected to cultivation as an experiment to determine its effect on the rate of growth.

German Forests

In the February issue of the Forestry-Geological Review, the statement was made that Germany as a nation does not own forest lands. This was stated to show that Hitler in issuing an edict about forestry management was assuming undue authority. To correct a possible misconception that there are no public owned forests in Germany, the article may have created, it is hereby explained that the provinces and towns of Germany own 52 per cent of the forest lands.

COST OF INVENTORY AND SELECTIVE CUTTING SURVEY

According to studies made by the Southern Forestry Experiment Station on mixed pine and hardwood stands, an inventory and marking for selective cutting cost less than 1/2 cent per thousand feet of standing timber, based on a 2 1/2 per cent timber cruise. Where a detailed inventory included a 100 per cent cruise of trees 13 inches in diameter and over (4 1/2 feet from the ground), the marking of trees to be cut and a detailed map on nearly 3,000 acres cost 1 cent per thousand feet of timber to be cut, or slightly over 1/2 cent per thousand feet, if the total stand is considered. The stand averaged 7,000 feet per acre.

Beetle Damage Heavy

According to studies made in Oregon and Washington, the U. S. Forest Service reports that beetles have destroyed more timber during 5 years ending with 1933 than the sawmills have cut, or the damage fire have done.

A campaign of beetle control, by the U. S. Forest Service, the state forest service and private owners is being conducted.

Future of Lumber Code

Wilson Compton, general manager of the National Lumber Manufacturer's Association, says of the future of the lumber code:

"As to the Lumber Code, it means minimum prices are out, and to stay out. It puts up to the industry the control of production. If there is too much industry resistance to production regulation, out they will go, too. That, it would seem, is fast enough. But if it goes out, direct Government control goes in."

Philippine "Mahogany"

The use of the term "mahogany" in connection with Philippine woods not mahogany, is contested by the Hardwood Manufacturers Institute, the Mahogany Association and the American Hardwood Association. The federal trade commission has ruled that a qualifying word "Philippine" could be used. The petitioners claim the such descriptive term does not protect the public.

"Peppermint", C.C.C. Paper

A CCC camp publication, issued by Company 1450 at Douglas, Georgia, is entitled "Peppermint", and as the name would indicate, it is a spicy publication. The editorial staff consists of Henry W. Derd, advisor; Julian Pipkin, editor; with Ernest Mink, Hamilton Harrel, Olin Hensley, George Miller and J. C. Cox, contributors.

Business firms of Douglas are supporting the publication with advertisements.

Tree plantings today are likely to be the children's safest legacy.

GEORGIA'S LEADERSHIP AGAINST FEDERAL FOREST OWNERSHIP

Statements made in the American Forestry Digest and the Forestry-Geological Review by Governor Eugene Talmadge, T. G. Woolford, president of the Georgia Forestry Association, State Forester B. M. Lufburrow, Alex K. Sessoms, Cogdell, and Hon. James Fowler, Soperton, against federal acquisition of forest lands for commercial development, has stirred up nation wide comment and approval.

In forestry circles Georgia is looked to as the leader in championing private forestry. Opposition to federal acquisition of forest lands for commercial development in competition with privately owned forests, has been consistently maintained by the Georgia Forestry Association for several years. Foresters in various parts of the country have expressed their approval of Georgia's position in the matter.

North Carolina Forestry Association Favors Federal Purchase With Limited Harvesting

At its annual meeting, the North Carolina Forestry Association adopted a resolution endorsing further acquisition and development of state and federal forests for the purposes of timber growing and demonstration in forest management, and recommended that timber grown on public forests should not be harvested and manufactured except in emergency, through private agencies.

CCC Forestry Classes By Vocational Forester

L. F. Morey, secretary-treasurer of a timber protective organization, according to "Peppermint", a CCC publication issued at Douglas, is giving classes in forestry to the camp boys. This is a voluntary work of Mr. Morey's and is much appreciated.

Morey is a vocational forester, having received his certificate from the Georgia Forest Service at its vocational forestry camp. He hails from Sale City, and previous to taking up his present work was foreman in a CCC camp.

Bee Tragedy

A pitiful spectacle recently encountered in south Georgia was a number of bee hives in the edge of a pine forest blackened with burning. The scourge of fire had fallen upon all the forested land for three or four miles.

If one wanted to starve honey bees, burning off the forests is a successful way.

"It is queer how a blunt statement is also a sharp one"—Southern Lumberman.

No one has proposed taxing one's patience, realizing perhaps that it has been taxed enough.

FORESTRY QUESTION BOX

Why do foresters recommend that pine seedlings be placed in a bucket of muddy water as soon as taken from the ground?

Drying out of pine roots is very certain to result in the death of pine seedlings. Experiments have shown that when exposed to the sun or wind for only ten minutes, 5 per cent of the seedlings die; when exposed 20 minutes, the rate of mortality is 10 per cent; 30 minutes, 70 per cent; 45 minutes, 90 per cent; and an hour, probably 100 per cent loss.

Muddy water is considered preferable to clear water because of its tendency to coat the roots and keep the sap from issuing from the roots into the water.

How can one distinguish a young loblolly from a young slash pine?

A young slash that for any reason is not growing needles to full length, may be easily confused with a thrifty young loblolly. Both have clusters of two and three needles, but the loblolly has decidedly more three needles to the cluster than two, whereas the slash has a more nearly equal amount of each.

The length of the needles of loblolly is normally 6 to 8 inches, whereas slash is normally 8 to 12 inches long.

The shape of the needles differs. The slash is semi-circular with a flat base, as if a round needle had been cut in half, whereas, the loblolly has a flat arch and an angular base.

What is meant by selective cutting?

It means a system of forest management whereby relatively frequent crops may be obtained, as opposed to clean cutting and less frequent harvesting. In carrying out the sustained yield plan, a minimum diameter of trees to be cut is established and only the maturer trees are cut. Care is taken to preserve the younger trees in felling and logging, care of slash, fire protection and the promotion of natural reforestation.

Those who favor selective cutting to clean cutting of even-age trees believe that greater production per unit area can be obtained.

Correction

In the February issue, an error was made as to the amount of pine seed to be used in planting a 12 x 4 seed bed. The intention was to recommend the use of one-half a pound, but it has been customary to recommend more for inexperienced people.

The heaviest tax imposed on forest land and often willingly paid, is collected by fire.

FIRST DISTRICT

Russell Franklin, Dist. Forester
Rome

TPO Items

Mr. Sam Tate, of Tate, Ga., called a meeting of Pickens county landowners for Monday, March 18th, in the interest of a county-wide Timber Protective Organization for that county. The county commissioners have signified a willingness to cooperate with the landowners in making this a success.

Much interest is being shown in this district in the possibilities of the county-wide system of forest fire control. It is very evident that a little opposition on the part of any of the members, or the county commissioners to this type of organization would kill the whole thing. It is my opinion that the fire protection benefits from this type organization are not as great as received from the private type, due to the fact that every one in the county is not in favor of 100 per cent fire protection.

On the other hand, the county wide system is proving very valuable from the standpoint of being able to use the money to hire a good man to contact the individual landowners and actually find out and write down the names of the ones interested in fire protection, and to sign up those interested.

The policy followed in this district is to divide the county into units according to the interest shown, and to further divide these units into more or less solid protected areas so that the patrolmen and others will know just where to work and where more can be accomplished.

The value of these men hired in the county is doubly felt when the necessity of calling a meeting arises. Everyone knows the obstacles encountered when going into a new area and trying to work up a TPO. When a local man is on the ground to spend his time and energy contacting the landowners and seeing that they attend the meetings, many of these obstacles are erased. Taken as a whole I think that the county-wide system is capable of rendering good service.

Appreciation of the "Review"

Every district forester and all others who have had articles to appear in the "Review" realize the value of this paper. It is our one and only chance to give vent to our expressions and ideas and see them appear in print. It is the only way that we can pat ourselves on the back, tell everybody how hard we are working and what we are accomplishing. I know that we get new ideas from the reports of the district foresters appearing each month in the "Review", and that sometimes it causes us to get a new slant on some phase of the work that has probably puzzled us before.

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

Tree Nursery Notes

Beds are being prepared and planting will begin the first week in April at the north Georgia nursery.

Black locust seed have been secured and if germination is successful, seedlings will be available for distribution next planting season.

The north Georgia nursery will be able to supply black walnut, loblolly pine and black locust next planting season.

Flying Fish

Lee J. Anderson, who is game technician for the U. S. Park Service in Georgia, told me this one: He was fishing on Lake Burton last season in a boat. After a while a heavy fog came up. The fog was so thick he couldn't see how to paddle, so he let the boat drift. He was getting plenty of bites, so he kept fishing. He had caught 15 big bass, when all of a sudden his boat dropped to the ground. The weather cleared and he found he had been fishing on the land 50 feet from the lakeshore. They must've had wings.

Accommodating Dog

Cliff Arline writes me this one from Thomas county. He states that he has a most remarkable bird dog. While hunting in February down in the piney woods, his dog pointed. He eased up behind the dog in shooting position, and a single bird flew up, which he immediately killed. He loaded his single barrel gun, took another step and another single bird flew up, which he also killed. This went on until he had killed 10 birds. Upon investigation he found that his dog had pointed the birds in a gopher hole and had his legs covering it so as to let one bird out at a time.

THIRD DISTRICT

**C. N. Elliott, District Forester
Augusta**

Young Farmer Practices Forestry

LOGANSVILLE, Ga. — Although Bruce Gower has never had, until this school year, forestry training, for the past two years he has been carrying on forestry work at his father's farm. He supervises all the cutting of winter wood, and is taking out undesirable trees, as crooked trees, unprofitable species and thinning where the groves are too thick. In the cutting of winter wood each year on his farm, the stands of timber have been improved. Fire breaks have been constructed around much of the area on his farm, and seedlings set out on land unprofitable for other uses. Bruce Gower should be one of the outstanding members

of the new forestry club recently organized at Logansville.

Fire Breaks Protect State Forest

AUGUSTA, Ga. — The entire area around Gwinn-Nixon State Forest in Richmond county has been burned over during the past four months, but the forest itself, protected by fire breaks and darkies who live near it, has been kept free from fire. After two years of protection, natural pine reproduction is appearing over the entire area. Approximately 50,000 seedlings, longleaf and slash pine, black walnut, red cedar, cypress and black locust, have been planted on the 100 acre demonstration tract.

Want a Forest Fire Patrolman

THOMSON, Ga. — McDuffie county recently decided to put on a county patrolman. The county officials, county agent and board of trade were in favor of the movement, and went to the grand jury for a recommendation for such a movement. The grand jury decided against it. Leading citizens of the county have taken the matter in their own hands and are working to put on a county wide patrolman through donations from the land owners of the county.

Piedmont Plantation Project

EATONTON, Ga. — The most extensive work on the Piedmont Plantation project will be in forestry. It has been found that approximately 68 per cent of the entire 150,000 acres involved in the project is in forest land, and an extensive program for the development of this area has been mapped out by the officials in charge. A complete fire control system with five fire towers, 15 telephones, a number of fire wardens, and many miles of fire breaks has been recommended. Planting, improvement cutting, a nursery—are all on the program. Erosion control and recreation are also main features.

CCC Work at Crawfordville

CRAWFORDVILLE, Ga. — Unless there is a further change of plans, the CCC camp Sp-5, will be moved from Crawfordville on April 1. At that time the camp will have completed two years of work on the Alexander H. Stephens Memorial Park, on the land of the Woodville TPO, and on the State Hospital land at Milledgeville. There have been many changes in the army and forestry personnel during that time, but the work has progressed rapidly and smoothly. The main features of the work on the park have been repairing the home of Alexander H. Stephens, landscaping the entire two hundred acres in the park, and building a lake below the spot where the camp is now located. Most of the work done will add permanent beauty and value to the park which lies around the home of the Confederate States' Vice President.

FOURTH DISTRICT

**W. G. Wallace, District Forester
Columbus**

Houston County Organizes TPO

A group of determined citizens of Houston county attended a meeting at the courthouse in Perry on March 2nd and organized the Houston County TPO. Mr. W. T. Middlebrooks, county agent, called the meeting and is largely responsible for the successful beginning made. Mr. Middlebrooks, who helped organize a successful TPO in Screven county was selected as temporary secretary of the new Houston County TPO and is expected to be an important factor in its future success. Other officers are, J. Meade Tollerson, Pres., S. A. Nunn, Vice-Pres., and W. E. Beckham, Treas. A board of eight directors was also elected.

Much of Houston county is primarily agricultural land, but the TPO is to serve an area of from 50,000 to 100,000 acres of practically unbroken timberland badly in need of protection. Apparently, more than half of this area has burned over this winter and spring, amounting to damage totaling many thousand dollars. Ample protection will enable this natural timber raising country to restock with full stands of pine and to produce its owners a much greater profit from the many benefits received from keeping fire in the woods down to a minimum.

More About Direct Seeding of Longleaf Pine

In the March issue of the Review I had an article dealing with the spot planting of longleaf pine seed in the field where it is desired to reforest. I have not had reports yet on the success of recent plantings or sandy land in Taylor county. But I must report that a "gamble", recommended as such by me, was tried on about ten acres of open field in Meriwether county, and very unfortunately, the field mice had a grand feast. Planting of one-year nursery grown pine seedlings is therefore indicated as best choice here.

Thanks, Mr. Young

Many thanks to District Forester Young of Gainesville for so opportunely bringing out the important educational value of planting and raising pines as a hobby or otherwise. This was a constructive criticism, in March "Review", of my article in the February "Review".

Since the subject has been brought up and commented on favorably, let me suggest that the reader plan for a trial planting of one or more acres in pines next season. Write your district forester now for an order blank so that you can place an early order for seedlings to be delivered and planted next fall or winter. Start something you will be proud of.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

T. P. O.'s Consolidate

At a recent meeting held at the county courthouse in McRae, delegates from three timber protective organizations voted to consolidate into one unit.

The three old organizations, Ocmulgee in Telfair county, Dodge in Dodge county and the Little River TPO in Wheeler county, united and will operate under the name of Ocmulgee Timber Protective Organization.

A board of directors was appointed and the following men were named. R. F. Jordan of Lumber City, B. J. O'Connor of Jay Bird Springs, O. N. Tharp of McRae, A. P. Smith, of McRae and Archie Coffee of Eastman.

New officers were elected, being selected from the men composing the board of directors. They are:

President, R. F. Jordan; Vice-President, B. J. O'Connor; Sec.-Treas., O. N. Tharp.

There are 140,000 acres listed in the Ocmulgee TPO since the reorganization and more land and members are anticipated. The board of directors approved the hiring of a full time assistant secretary-ranger who will have full charge of directing all TPO activities and head up the entire system of protection work.

Assistant TPO Secretaries

The Liberty TPO hired an assistant secretary-ranger, effective March 18th, to take charge of protection activities on lands listed in this area and to coordinate all the work in order that the Liberty and Long organizations could be consolidated and the TPO expanded.

Mr. E. R. Banls, Jr., was selected as assistant secretary-ranger and immediately assumed his new duties. It is the aim of the TPO to keep this man employed full time and to take charge of all TPO activities in this section.

Treutlen TPO

A meeting will be held soon and all lands under protection in Treutlen, Montgomery, Laurens and Toombs counties will be listed in the Oconee Timber Protection Organization. The existing Treutlen and Oconee TPO's will be combined and enlarged.

Mr. R. P. Marsh has recently been hired as assistant secretary-ranger and is at work now signing new members, collecting assessments and working toward the consolidation of the existing units into one TPO.

The assistant secretary-ranger will be employed full time and will be held responsible for all TPO activities and protection work in the above four counties. It is hoped and expected that in the near future, the two tower detection system now in operation in Treutlen county will be in-

creased to seven towers in the four counties.

Director of E. C. W. Visits

Mr. Robert Fechner, Director of Civilian Conservation, Washington, D. C., accompanied by State Forester Lufburrow and Mr. J. M. Mallory, member of the Forestry and Geological Commission, visited Camp P-81, Bloomingdale, Saturday, March 16th.

A delicious lunch was served by Captain Smith and after Mr. Fechner inspected the camp buildings and equipment, the party inspected the work in the field which included fire breaks, truck trails, tower and telephone line construction.

SEVENTH DISTRICT

**C. Bernard Beale, Dist. Forester
Waycross**

C. C. C. Items

Camp P-52, Homerville—Superintendent T. H. Browne's boys turned out a good basket ball team this year. They played 24 games, winning 22. They won the district championship by defeating the team from Sebring, Florida, runners-up in the league. The boys at this camp are also interested in boxing.

Camp P-59, Fargo—With the aid of the radio system in the Suwanee TPO area the boys at this camp are getting out to fires in record time and are holding fire losses to a minimum.

Camp P-60, Woodbine—Superintendent Elmer Dyal's boys have plenty of sport, since that area is noted for its game and fish. This recreation probably has a lot to do with the volume of work being done from this camp.

Camp P-62, Baxley—The boys at this camp have been doing most of their fire fighting at night but are holding their own in keeping fire losses to a minimum.

Camp P-65, Jesup—A dynamite demonstration was held at this camp February 21 by the Dupont Powder Company. Representatives from most all of the camps and forest districts of the state were present. Since then this camp has been experimenting to find if dynamiting is more economical in getting out stumps than pulling them with tractors.

Camp P-68, Douglas—The side camp at Pearson has been completed and is manned from this camp. Superintendent Tittle's boys are doing some good work in this section.

Camp P-70, Nahunta—Tower Foreman W. W. Garwood arrived here several days ago from the Jesup Camp. He has finished

the two towers for the Wayne TPO and is now supervising the construction of the wooden towers to be located at Chappel's Crossing and Zuta on the Brunswick-Penn. area in Glynn county. This work is being done by men from the Waynesville side camp.

Camp P-84, Folkston—The TPO wooden towers at Winokur and Stokesville have been completed and are now in "operation", having had telephones installed and towermen employed for same. Foreman Wilmer Jones who supervised the construction of these towers has been transferred to the camp at Douglas to erect the ECW steel towers that are to be located on the Coffee-Jeff Davis TPO area.

General News

Telephone Engineer F. L. McClung, who was transferred to this district several weeks ago, has done some very good work in revising the telephone systems of the various TPO's in this district. He has completed the plans for the Consolidated, Brantley, Camden and Brunswick-Penn. areas and is now working on the Wayne system.

Mr. J. B. Lattay, ECW forester, from the Savannah district, has recently been transferred to this district. Since arriving here Mr. Lattay has been visiting the various camps and "setting" them right on type and strip mapping.

Chief Forester F. A. Silcox, Mr. Joseph C. Kircher, Regional Forester, Mr. C. F. Evans, Regional Forest Inspector, and Mr. B. M. Lufburrow, State Forester, were in this district several days during March on inspection of the work being done by the camps in southeast Georgia. While here they inspected the work being done by the Georgia Forest Products Company in Camden county and Timber Products Company in Clinch county.

TPO NEWS ITEMS**Berrien-Cook TPO Holds Meeting**

A group of landowners met with District Forester Beale and County Agent D. L. Branyon, March 23, with the object of reorganizing and developing this TPO. The district forester outlined the work necessary for the development of this area and from the interest shown by those present it is believed this TPO will increase its acreage sufficiently to become an active organization. Mr. Branyon, who is acting secretary, and several of the landowners are very enthusiastic and are working hard to get this TPO to materialize.

Brantley TPO Appoints New Secretary

Mr. E. G. Strickland was appointed secretary of the Brantley TPO to replace Mr. S. N. Smith, who resigned to accept a position with the Tennessee Valley Authority

in Knoxville, Tenn. While in the employ of the Brantley TPO Mr. Smith proved to be an efficient and a very conscientious secretary, which accounts largely for the activeness of the TPO today. We wish him great success in his position with TVA.

Hurricane Creek TPO

Secretary P. B. Copeland has been busy signing up new members in the Pierce County section of this area. Landowners in this section are becoming more enthusiastic and are showing a greater willingness to cooperate than ever before.

Coffee-Jeff Davis TPO

Secretary L. F. Morey has been plenty much on the "go" since getting his new plow and tractor, and plowing secondary firebreaks for his members.

This TPO will soon start work on its telephone and tower systems. Locations for three towers have been selected. One TPO steel tower and two ECW steel towers will be erected in this area. The plans for the telephone system have not been completed but the installation of the system will be started as soon as possible.

Charlton TPO Appoints Full Time Secretary

At a recent meeting of the Charlton County TPO Executive Committee, Mr. L. Jasper Stokes was appointed as full-time secretary.

Mr. Stokes is proving to be an enthusiastic and capable secretary and has increased the acreage in the TPO considerably since his appointment.

EIGHTH DISTRICT

H. D. Story, Jr., Dist. Forester
Albany

Tree Nursery

Whether Congress will release funds for erosion work soon enough to establish tree seed beds to grow seedlings for planting this year on land that is to be reclaimed, is a matter of much concern at the tree nursery.

If the order does not come too late for seed planting this season, the state nursery can rally a large number of FERA workers and do a quick job. Everything is ready for the jump.

The state's beds are all planted in good shape. The area seeded is greater than ever before, being 246,000 square feet. This should produce 7½ million seedlings having the following ratio: 50 per cent slash pine, 35 per cent longleaf pine and 15 per cent loblolly pine.

School Forests Surveyed

In company with Mr. C. A. Whittle, educational manager, in late February, school forests were surveyed at Morven High School, A. P. Higginbotham, teacher; Meigs

High School, A. M. Pulliam, teacher; Fort Gaines High School and Bluffton High School, J. A. Ariail, teacher; Ty Ty High School, J. H. Chapman, teacher.

The primary object of the trip was to establish a school forest where vocational agricultural teachers have been located for the first time this year; to make forest management plans for the school forests and start the teachers on the field practices of their forestry projects.

Flint River TPO

The Flint River TPO now has a full time, paid secretary. Decatur county is assisting the organization in providing funds for his employment. He is employed in addition to the patrolman who has been on the job for a year.

More interest is now being shown in protection work than at any recent time. The organization's pool fund is increasing rapidly and the goal of a tractor and plow for break maintenance is within sight.

A new ECW tower has arrived and will soon be erected together with a system of telephone lines into a part of the territory which heretofore has not been so served. This will add much to the effectiveness of the present tower and system through check readings on fires which are now near the limit of visibility.

PERFECT ALIBI

Prosecutor: "Your Honor, I shall have to ask that this defendant be discharged; we have just learned that at the time the crime was committed this man was in jail."

Judge: "In jail! Prisoner, why didn't you say so before?"

Prisoner: "Your Honor, I was afraid it would prejudice the jury against me."

Southeast Lumbermen Would Limit Federal Acquisition

A representative group of one hundred lumbermen from the states of Virginia, North Carolina and South Carolina, met in Raleigh, on February 12, and adopted the following resolutions:

RESOLVED that a limited acquisition of cut-over and timber lands by State and Federal governments is in the public interest for development of state and federal forests and parks; timber growing; demonstration in forest management; stream protection; recreation; wild life perpetuation; and the preservation of scenic and historic areas, and—

RESOLVED FURTHER that it is the sense of this meeting of lumbermen operating in the states of North and South Carolina and Virginia that we are unalterably opposed to the federal and state governments and their subdivisions engaging in the operation of industries competitive with private enterprises, and that the individuals engaged in this industry should forcefully make this position known to the Congress and our state legislatures.

Building Made of Plywood

A unique construction method is being used in a service and storage building now going up on the grounds of the Forest Products Laboratory at Madison, Wisconsin. The structure is over 220 feet long and 46 feet in its greatest width. Outside wall panels are of plywood cemented with hot-pressed phenolic resin glue, which is unusually resistant to moisture.

Unit panels of joist and plywood construction are used for the main roof deck. They are fastened to the arches with casein glue. The arches are built up to heavy timber sizes by gluing 9-16 in. laminations together.

A high, wide interior, unobstructed by columns, is provided through the use of modern timber connectors in roof trusses made of built-up timbers.

Spanish Moss

Spanish moss, which is so common throughout the far South, is technically not a moss but a bromeliad or a member of the pineapple family. It is known botanically as *Tillandsia usenoides* and has many popular names such as Florida moss, New Orleans moss, tree-beard, vegetable wool, etc. Spanish moss is commonly used for stuffings for mattresses, horse collars, automobile upholstery, and packing material. The seeds of bromeliads are produced in enormous numbers and are scattered far and wide by the wind, for the seeds have attachments for floating in the air after the manner of milkweeds and dandelions. Spanish moss is found principally growing on cypress and the broad-leaved trees. However, on wet sites, it occurs on several species of pine and cedar. It is an epiphytic (epi-surface, phyte-plant) plant, relying upon its host solely for support, and this is evidenced by the fact that Spanish moss frequently occurs on telegraph wire and chicken wire fence, especially where shaded. Spanish moss, being a green plant, is not parasitic as commonly believed and, as far as is known, is harmless to its host tree. —Southern Forestry Experiment Station.

PERFECT MATCH

Pa—"The man who marries my daughter will need a lot of money."

Him—"Then I'm just the man."

The whole mineral industry mourns the passing of Mr. Paul Gilreath, prominent citizen and ex-mayor of Cartersville, Georgia. Mr. Gilreath had done much to aid in the development of Georgia's mineral resources. His support and encouragement will be sorely missed by all who knew him.

State Geologist Richard W. Smith recently spoke to the science survey classes of the University of Georgia. His talk was arranged to introduce that portion of the course dealing with geology.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE MINERAL PRODUCTION OF GEORGIA FOR 1933

by

RICHARD W. SMITH

The value of the mineral production of Georgia for 1933, including water power, was \$18,740,930, an increase of nearly 20 per cent over that of 1932. Exclusive of water power, the value of the mineral production in 1933 was slightly less than that of 1932. This does not mean that Georgia is declining as a mineral producing state. The decline is largely accounted for by the figures for granite, marble, and Portland cement, and of these granite and marble showed increases in the tonnage pro-

such minerals so as to conceal individual values.

The collection of the statistics of the mineral production of Georgia is undertaken by the United States Bureau of Mines and the United States Bureau of Census, with the cooperation of the Division of Geology of the Georgia Department of Forestry and Geological Development. The gathering of this information is a slow process, as many firms do not report their productions until considerable time has elapsed.

Barite: Barite is a heavy white mineral which, when ground, is used largely in the manufacture of lithapone for use in paint. It is also used in the manufacture of ba-

dle Georgia. The production in 1933 all came from Sumter county and was largely used in the manufacture of alum salts for use as a water conditioner.

Cement: Portland cement was manufactured from limestone and either shale or clay at two plants, one in Polk county and one in Houston county.

Clay (kaolin): Georgia produces nearly 65 per cent of the kaolin mined in the United States for use as a filling and coating clay in the manufacture of paper; as a filler in the manufacture of rubber, oil cloth, and other products; and for use in the manufacture of china and other white ware. Its use in these products is largely replacing the English clay formerly used. It is also used in the local manufacture of high grade fire brick and other refractories. This sedimentary kaolin was mined in 1933 in the following counties, named in order of the value of production: Wilkinson, Twiggs, Richmond, Washington, Hancock, Glascock, Baldwin, Houston, and Taylor. The 1933 production showed a marked increase over that of 1932, and preliminary figures indicate that the 1934 production may be the largest in history.

Clay Products: The production of brick, sewer pipe, and tile from Georgia clays, although amounting to over a million dollars in 1933, is still far below that of normal times. Common and face brick and structural tile are manufactured from the alluvial clays of middle Georgia. Sewer pipe, structural and roofing tile, and common and face brick are made from the shales of northwest Georgia. The production will probably increase with the recovery of the building industry.

Coal: Only one coal mine is reported in operation in Georgia; that of the Durham Land Company on Lookout Mountain in Walker county.

Fullers Earth: Fullers earth is a variety of clay used mainly in refining oils. That produced in Decatur county is used with mineral oils, whereas that mined in Twiggs and Wilkinson counties is used mainly with vegetable oils.

Gold: Georgia's gold industry, already stimulated by the depression, was greatly increased in 1933 by the advance in the price paid for newly-mined gold. The 1933 production was double that of 1932, and in 1934 the production was probably again doubled. About 15 gold mines are in active operation and development work is in progress on a number of others.

Granite: The eight counties producing granite in 1933 are in order of the value of their production: DeKalb, Elbert, Madison, Warren, Henry, Oglethorpe, Hancock, and Pickens. The quantity produced in 1933 was slightly more than in 1932, but the value per ton was less.

Kyanite: A small amount of kyanite, and aluminum silicate used in the manufacture of refractories, was produced for the first time in Georgia in 1933. The deposit, located in Habersham county, consisted of a

TABLE I
THE MINERAL PRODUCTION OF GEORGIA FOR 1933

Material	1933 Tonnage	Change from 1932	1933 Value	Change from 1932
Clay	280,098	+20%	\$1,417,080	+18%
Marble	48,950	+10%	1,404,876	-11%
Granite	554,280	+2.4%	1,099,196	-18%
Clay Products			1,282,412	+3%
Bauxite*		+110%		+110%
Fullers Earth*		+7%	1,409,876	+2%
Portland Cement*		-43%		-15%
Limestone, Lime	316,308	-38%	288,830	-38%
Talc*		-53%		-41%
Slate*	19,197	-14%	130,149	-19%
Mica & Chloride Schist*		+7%		+22%
Tripoli*		none in 1932		none in 1932
Sand and Gravel	247,030	-15%	124,544	-2%
Barite*		+52%		+55%
Ocher*	47,230	+59%	337,397	+63%
Manganese*		+1%		+47%
Coal*	41,684	+52%	77,564	+60%
Iron Ore*		-68%		-63%
Gold and Silver			11,566†	+100%
Total			\$ 7,584,090	-1.8%
Water Power			11,156,840	+24%
Grand Total			\$18,740,930	+19%

*Less than three producers, so production and value cannot be shown separately.

†Statistics for value of clay products are collected only on odd numbered years. The value used for 1932 is estimated.

‡The value of the gold production is at the Mint valuation of \$20.671835 per ounce. If the average premium for newly mined gold had been used it would have added approximately \$2,730 to the value of Georgia's gold production. The figures given include \$23, the value of the silver recovered in the gold.

duced although the value per ton was lower in 1933 than in 1932.

Table I below is a summary of the tonnage and value of Georgia's mineral production for 1933, together with the percentages of increase or decrease over the 1932 figures. The statistics for minerals of which there are less than three producers in Georgia are confidential and cannot be revealed. These minerals are marked below with an asterisk (*) and their values have been reported in combination with other

rium salts, in the refining of sugar, in glazing pottery and enameling iron, and as a filler in the manufacture of paper and rubber. All of the 1933 production came from the Cartersville district of Bartow county.

Bauxite: Bauxite, the oxide of aluminum, was first discovered in America in 1887 near Rome, in Floyd county, Georgia. Since that time it has been mined in Floyd, Bartow, and Polk counties in northwest Georgia and in Wilkinson, Macon, Randolph, Schley, and Sumter counties in mid-

surface accumulation of kyanite crystals from a kyanite-mica schist. The figures on this production are not available for inclusion in the totals given in Table I.

Iron Ore: Iron ore was mined in 1933 by only one company, in Floyd county.

Lime and Limestone: The only plant reporting a production of lime in 1933 was in Bartow county. The five counties producing limestone, in order of value of their production are: Houston, Gilmer, Pickens, Bartow, and Polk. The larger part of this production was used as a road material, but limestone, both crushed and ground, was used for many other purposes.

Manganese: Seven companies in the Cartersville district of Bartow county and one in Polk county reported production of manganese or manganiferous iron ore in 1933.

Marble: The Georgia Marble Company, with quarries in Pickens and Cherokee counties, was the only producer of marble in 1933. The production included a small amount of serpentine or verde antique.

Mica and Chlorite Schist: No production of scrap or sheet mica was reported in 1933. Chlorite schist, used principally as a filler, was mined in Cherokee county.

Ocher: Ocher, a hydrated iron oxide used in the manufacture of linoleum, oil cloth, and as a coloring for mortars, was produced by two companies in the Cartersville district of Bartow county. The production for 1933 showed a considerable increase over that for 1932.

Sand and Gravel: Sand and gravel are produced at a number of small pits widely scattered throughout Georgia.

Talc: Only one of the three talc companies near Chatsworth in Murray county reported a production of ground talc and talc pencils used for marking iron and steel.

Tripoli: A small production of tripoli, used for abrasive and filler purposes was reported for the first time in several years. The production came from a mine near the foot of Lookout Mountain in Chattooga county.

Water Power: The amount of electricity for public use generated by water power in Georgia in 1933 showed a considerable increase over that reported for 1932. The value was figured at one cent per kilowatt-hour, the approximate value of the electricity at the source of production.

Preliminary figures received indicate that the mineral production in Georgia in 1934 will show a substantial increase over the figures for 1933 given above.

Georgia mineral producers may be interested in the following articles that appeared in the March, 1935, issue of the *Engineering & Mining Journal* (McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York, N. Y., \$5.00); *More Facts on the Flotation of Free Gold*, by L. H. Lange; *Gold at Hog Mountain, Alabama*, by C. F. Park, Jr.; and *The Refractories Industry*, by Paul M. Tyler.

SURVEY OF OIL AND GAS STRUCTURES SOUTH GEORGIA

State Geologist Richard W. Smith announces that he is negotiating with the U. S. Coast and Geodetic Survey in an effort to get them to make magnetic and gravity surveys in certain areas in south Georgia for the purpose of locating geologic structures that might be favorable for the accumulation of oil and gas. Mr. Smith states that the belief that oil and gas in commercial quantities may exist far beneath the surface in south Georgia has led in the past to the drilling of a number of test wells, none of which have been successful. About ten years ago the State Geological Survey made a thorough study of the possibilities of oil and gas in Georgia and came to the conclusion that, while there is a possibility that oil and gas may exist in south Georgia, it is not possible to locate the favorable geologic structures from the surface geology. The geophysical survey that the Coast and Geodetic Survey would make would serve to locate the most favorable areas in which the test wells of the future should be drilled.

Mr. Smith states that the possibility of finding oil and gas in Georgia is confined to the Coastal Plain region of south Georgia. The Piedmont and mountain sections of Georgia are underlain by dense crystalline rocks that have passed through at least two periods of intense folding accompanied by such heat and pressure that any oil and gas that they may have contained was destroyed millions of years ago. This area includes Franklin county in which there was an oil boom several years ago. Oil and gas in commercial quantities have never been found in this type of rocks in any section of the world.

Northwest Georgia is underlain by rocks of the same age as those in which oil has been found in Tennessee and Kentucky, but in Georgia these rocks have been folded and leveled off by erosion so that any oil that they may have contained probably leaked out years ago.

Mr. Smith advises those desirous of drilling oil wells to confine their efforts to south Georgia where they have at least a gambler's chance of striking oil or gas.

Prospects for Topographic Mapping Water, Mineral Survey

State Geologist Richard W. Smith attended meetings of the American Institute of Mining Engineers in New York and of the Association of American State Geologists in Washington. At the New York meetings Mr. Smith participated in the symposium on the world's gold resources and attended a conference on the proposed National Mineral Policy for the United States. The State Geologists in session at Washington discussed the relation of the government's land utilization program to the mineral industry, and endorsed the proposed ten-year program for the completion of the topographic maps of the United States and the

recently issued report of the Federal Planning Board.

The Public Works program, for which the President has asked Congress to appropriate \$8,000,000, is expected, according to Mr. Smith, to include the completion of the topographic maps long needed for all engineering purposes, a study of the surface and underground water resources of the United States, an inventory of the minerals deficient in America for war-time needs, and a study of the best utilization of the so-called "surplus" minerals.

Mr. Smith states that Georgia would benefit considerably if these plans are carried out. The present plans call for the completion of 190 topographic maps within the State during the first five years. The study of the state's water resources would give the information needed for the proper location of paper and other manufacturing plants. The mineral investigations would include such minerals as manganese, barite, and mica, of which Georgia has large supplies. It is expected that this work will be financed entirely by Federal funds and will not require financial cooperation by the state.

FROM A GEOLOGIST'S NOTEBOOK

The newly organized Georgia Mineral Society was addressed by Professor Count Gibson of Georgia Tech at its regular monthly meeting held on March 11th. Professor Gibson spoke on *Fluorescent Minerals* and the members joined in a lively discussion of the subject.

Dr. C. F. Park, Jr., recently outlined his proposed plan of work on his survey of the gold resources of Georgia for the U. S. Geological Survey. Dr. Park plans to have one party visit and locate all known occurrences of gold in the state. This party will record the names of the owners, lot numbers, type of country rock, and all data concerning veins, history, and other items of possible interest. The locations will be compiled on one map. Another party will map in detail representative areas outside of the Dahlonega Special Quadrangle. Maps on a scale of 100 feet equal 1 inch and with 10 foot contour interval will be drawn. Detail maps of the Battle Branch, Barlow, and Findlay properties, with scale 1 inch equals 100 feet and 10 foot contour interval will also be made. Any available time will be spent mapping the Dahlonega Special Quadrangle. One man is to spend a month studying heavy minerals as a possible aid for future mapping.

Mr. B. S. Colburn, prominent gem and mineral collector of Asheville, N. C., has invited members of the Georgia Mineral Society to view his famous private museum and mineral collection. A motorcade to the North Carolina city is being planned.

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GEORGIA FORESTRY ASS'N ANNUAL MEETING MAY 17, 18

Fourteenth Annual Meeting at Macon to Stress Forest Fire Prevention — Program of Prominent Speakers Promises Meeting of Unusual Interest—Public Invited

The fourteenth annual meeting of the Georgia Forestry Association to be held at the Dempsey Hotel, Macon, May 17, 18, presents an array of prominent speakers that promises a meeting of unusual interest. Organized forest fire prevention is to be the keynote of the meeting. The appalling ravages of fire, the destruction of future crops of pines and the disfavor that woods burning has brought to the state in the eyes of prospective paper manufacturers, have alarmed the association to the point of making a desperate effort to stop forest fires and to sound a warning to land owners of the results that are to follow.

The executive committee of the Georgia Forestry Association held a meeting March 28 at Macon, discussed the alarming situation, decided to make the keynote of the fourteenth annual meeting organized forest fire prevention, and built a program around this theme. The program committee is W. T. Anderson, Macon; T. G. Woolford, Atlanta; and Judge Ogden Persons, Forsyth.

The meeting will open at 10:30 May 17. The morning session will be followed by a luncheon address, and the afternoon session, headed by Dr. Chas. H. Herty, will feature forest fire prevention. A banquet will be held Friday night, with prominent speakers.

Saturday morning's program will conclude the session, with prominent speakers, including Robert Fechner, head of the Civilian Conservation Corps.

The program outlined below was not complete as this publication went to press, but so far as arranged is as follows:

MORNING SESSION

May 17, 10:30 A. M. (Eastern Time)

Invocation

Welcome Address—Hon. Herbert Smart, Mayor of Macon

Response—Dean Paul Chapman, State College of Agriculture, Athens

President's Report—T. G. Woolford, Atlanta, President, Georgia Forestry Association



PINE SEEDLINGS AND WIRE GRASS—WHAT FIRE DO TO THE YOUNG TREES?

Why burning off wire grass of South Georgia can prevent natural reforestation is clearly shown by the above photograph. The tree seed have sifted through the grass, reached the ground, germinated, produced seedlings. The grass has been cleared from a spot to show them.

Note the heavy growth of vegetation around the cleared spot. How can anyone expect the seedlings to survive the heat of fire in such combustible material! Nature would long ago have reforested thousands

of open areas in Georgia but for the burning off of grass.

Killing the newborn trees by forest burning is a sure way to rob our children of their tree crops.

Effective measures have been taken by timber protective organizations to keep fire out of the woods with the result that satisfactory natural restocking is taking place.

A campaign is on in South Georgia to eradicate wire grass and sedge grass and to supplant them with carpet grass, a much better grass for grazing that very greatly reduces fire hazards.

Address—"Plea for Teaching Forestry in the Public Schools", Miss Emily Woodward, Vienna

Address—"Georgia's School of Forestry", G. D. Marckworth, Head, Division of Forestry, State College of Agriculture, Athens

Announcements

Business Session

See Exhibits

Luncheon, 1:00 P. M.—Thomas Hamilton, Augusta, Presiding

Address—Hon. Ed Rivers, Lakeland

AFTERNOON SESSION

2:30 P. M. (Eastern Time)

Dr. Chas. H. Herty, Presiding

Address—"Forest Fire Prevention and Why", Dr. Charles H. Herty

Address—"Georgia's Fire Problem", B. M. Lufburrow, State Forester

Discussions:

1.—U. S. Forest Service, Chas. F. Evans, Asst. Regional Forester, Region 8, U. S. F. S., Atlanta

2.—County Agricultural Agent, W. A. Lundy, Cordele.

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- 3.—County Commissioner, J. S. Hudson, Ellijay
- 4.—Turpentine Operator, J. S. Green, Butler
- 5.—Timber Protective Organization, W. M. Oettmeier, Superior Pine Products Co., Fargo
- 6.—Landowner, Hon. J. Henry Gaskin, Nashville, Ga.
- 7.—Future Farmers of America, O. M. Cates, Jr., Meigs, Ga.

Banquet, 7:30 P. M.

Toastmaster—T. G. Woolford
Address—W. T. Anderson, Macon

MORNING SESSION

May 18, 10:30 A. M. (Eastern Time)

Herbert L. Kayton, Savannah, Presiding

Address—"Keeping Forestry in Private Ownership", A. G. T. Moore, Southern Pine Association, New Orleans

Address—"What the Civilian Conservation Corps is Doing for Forestry", Robert Fechner, Director E.C.W., Washington, D. C.

Address—"Progress of Timber Survey in Georgia", Capt. I. F. Eldredge, Federal Forest Service, New Orleans

Address—"Erosion Control Program of Georgia in Relation to Forestry", Loy E. Rast, Director Soil Erosion Control, Athens

Address—"How the Women's Organizations of Georgia can Promote Forestry", Mrs. T. H. McHatton, President, Georgia Garden Clubs, Athens

Address—"Results of Intercropping Pines and Corn", Marion Renfro, Quitman
Report of Resolution Committee
Report of Nominating Committee
Adjournment

REPLACING WIRE GRASS WITH CARPET GRASS, LESPEDEZA

Better Pasture Grasses and Less Fire Hazard Would Result—Commission Approves Undertaking

A strong movement is on foot in south-east Georgia to supplant wire and sedge grass with carpet grass, lespedeza and Dal-lis grass.

Two objectives are in view—to provide better grazing and to lessen the fire hazard. Once established, carpet grass especially, will provide no inducement to cattle men to burn the woods to "green up the pasture." The "rough", which some consider so dangerous, is expected to naturally disappear.

On the firebreaks especially, carpet grass will keep the strips green most of the year, and if closely grazed will also prove a very good check to woods fires for the remainder of the year.

Just one disadvantage appears. Heavy grazing will result in heavy tramping, and little seedlings, trying to start growth, will not only be trampled, but they are likely to be cropped by the grazing animals, like bitterweed or wild onions are cropped in a pasture. Tramping and grazing, more than likely, will prevent reforestation.

This disadvantage may be overcome by restricting grazing until the seedlings are large enough to be out of danger. This applies equally well to artificial plantings.

Heavy grazing is also a hindrance to growth of trees of any age. If somehow, heavy grazing were limited to firebreaks, and light grazing to wooded parts, the results would be better.

Foresters are concerned chiefly with producing tree crops, and the livestock man thinks in terms of pasturage. The maximum production of one will not mean the maximum production of the other, but there can be agreement that where there is opportunity for grazing, there should be good grazing, and where existing inferior grasses make fire hazards, it is better to have pasturage that minimizes fire hazards.

Congressman Braswell Deen has been active in an effort to enlist the federal government in the undertaking and to use CCC labor in seeding the desired grasses.

Favored by Commission Forestry and Geological Development

At a meeting of the Commission of the Department of Forestry and Geological Development held April 9, the following resolution approving the undertaking to replace wire and sedge grass with better grazing grasses, that will also reduce the forest fire hazard, was passed:

WHEREAS, the Emergency Relief Program of the federal government contemplates nation-wide measures, the purpose of which is to conserve and improve the uses of land, water and other forest resources; and

WHEREAS, forest fires are the greatest

single menace to our forests, causing millions of dollars damage annually in direct losses to forests, and indirect losses from floods, soil erosion, etc.; and

WHEREAS, great benefits would accrue to our state if the native wire grass were destroyed and carpet grass were established instead. Carpet grass is a hardy native grass, and once established would keep down and prevent other vegetation from taking possession of the land. Its growing habits are such that it produces practically no inflammable material; therefore, it makes an almost perfect firebreak. Carpet grass is a splendid pasture grass for livestock, with a grazing capacity twice that of bluegrass and is suitable for grazing the greater part of the year. Now, therefore,

BE IT RESOLVED that the Georgia Forestry Association, through its duly constituted executive committee, does hereby approve, endorse and recommend the efforts begun and now being made by Congressman Braswell Deen and others to have the federal Forest Service, the Civilian Conservation Corps and/or federal agencies establish in Georgia large areas of carpet grass. By so doing, a better and more adequate fire protection system will be given our forests than could be given by the same expenditure of work and money in any other known method, and at the same time, a permanent foundation would be created for a profitable livestock industry.

BE IT FURTHER RESOLVED that a copy of this resolution be sent to Chief Forester Silcox, Director Fechner of the Civilian Conservation Corps and to all of the Georgia delegation in Congress.

GEORGIA FORESTRY ASS'N WANTS FOREST SURVEY OF SOUTH CONTINUED

The executive committee of the Georgia Forestry Association, at a meeting held in Macon March 28, passed a resolution favoring the continuance of the federal forest survey of the south, and commending Senator Richard Russell for his amendment increasing the available funds, and the support of other members of Congress, for their support of the measure.

It was pointed out that a complete survey of the forest resources is essential to the development of a paper making industry in the south.

W. T. Anderson, Host

W. T. Anderson, better known as "Bill" editor of the Macon Telegraph, was host to the executive committee of the Georgia Forestry Association at the shack in the woods March 28. It is hardly necessary to say "a good time was enjoyed by all."

Hosting may be one of his strong points but not the equal of his facile wit.

BURNED OVER FORESTS REPEL PAPER MANUFACTURERS

It is reliably reported that a representative of a large paper manufacturing industry of the north, looking over the southern field for a promising location for a mill, expressed himself in no uncertain terms about the widespread forest burning. He summarily dismissed from consideration the location of a plant where any considerable portion of an area is being burned over. He could not understand why people would burn their forests.

Of course no one could reasonably expect a paper mill to be interested in a region where every year, or every two or three years, people purposely burn over the woods and thus destroy seedlings, the future source of pulpwood on which the mills must depend.

It is, therefore, not surprising to learn that some prospective paper manufacturers lack faith in southern timberland owners' ability to grow future supplies of timber. This lack of faith is manifesting itself in steps being taken by some concerns to purchase and protect enough timberland to meet their needs. Will Georgians continue to allow fire to cut them off from the greatest potential market for pine timber they have had for a generation?

WOOLFORD AND KIMBROUGH NEW COMMISSION MEMBERS

Governor Eugene Talmadge recently appointed T. G. Woolford, Atlanta, and Hon. Henry Kimbrough, Chipley, as members of the Commission of Forestry and Geological Development.

Mr. Woolford succeeds himself as a member of the Commission. As president of the Georgia Forestry Association for several years, he is well known as a forestry leader. His aggressive opposition to government purchase of commercial forest land for commercial development has attracted nation wide attention. His vice presidency of the United States Chamber of Commerce has also brought him into nation wide prominence. His reappointment will meet with favor throughout the state.

Mr. Kimbrough's appointment will also be heartily approved by his many friends throughout Georgia. As a member of the General Assembly of Georgia, he was held in high regard for sound judgment and for his interest in promoting forestry in Georgia. "Uncle Henry", as he is familiarly known, has kept close to the soil and among his experiences is that he both lost and won in horse trading with President Roosevelt, his Warm Springs neighbor. Mr. Kimbrough, it is confidently believed by those who know him, will make a conscientious and safe leader in promoting the interests of forestry and geology in Georgia.

Joseph E. Lockwood, Savannah, was appointed April 1 as naval stores consulting specialist of the Agricultural Adjustment Administration.

USES OF GEORGIA WOODS MANUFACTURE FOR 1933

The total amount of Georgia woods used in manufacturing establishments in 1933 was 158,250,000 board feet, not a large amount because of the business depression, but the usual wide use of native timber is shown.

The following is data recently released by the United Census Bureau for Georgia.

Boxes, baskets and crates—White pine, 100,000 board feet; cypress 15,000; yellow pine 23,507,000; ash 4,000; cottonwood 548,000; black gum 5,999,700; magnolia 1,694,000; maple 1,000; oak 45,000; red gum 12,142,000; sycamore 600,000; tupelo 4,144,000; yellow poplar 4,080,000.

Car Construction and Repair—Cypress 270,000 board feet; Douglas fir 908,000; pine 10,507,000; ash 15,000; maple 101,000; oak 668,000; yellow poplar 122,000.

Caskets and Coffins—Cypress 2,134,000 board feet; pine 10,000; chestnut 197,000; yellow poplar 100,000.

Fixtures—White pine 7,000 board feet; Douglas fir 2,000; Ponderosa pine 5,000; southern pine 187,000; chestnut 3,000; maple 2,000; oak 4,000; red gum 25,000; walnut 105,000; yellow poplar 10,000.

Flooring—Pine 1,100,000 board feet; oak 3,000,000.

Furniture—Douglas fir 2,000 board feet; pine 65,000; ash 15,000; elm 220,000; black gum 25,000; hickory 15,000; oak 4,847,000; sycamore 132,000; tupelo 545,000; walnut 76,000; yellow poplar 2,305,000.

Handles—Pine 77,000 board feet; ash 2,083,000.

Patterns and Flasks—White pine 3,000 board feet; pine 4,000; foreign woods 5,000.

Sash, Frames, Doors, Blinds and General Millwork—Cypress 699,000 board feet; Douglas fir 13,000; Ponderosa pine 81,000; southern pine 4,412,000; oak 50,000; red gum 40,000; walnut 3,000; yellow poplar 65,000.

All other industries — Cypress 56,000 board feet; Douglas fir 2,000; southern pine 280,000; ash 681,000; hickory 307,000; magnolia 20,000; maple 15,000; oak 1,178,000; red gum 963,000; tupelo 15,000; yellow poplar 50,000; other native hardwoods 46,000.

TEN POINT DEER HEAD PLACED IN EVIDENCE

Any doubting Thomases, Bills, Joes, etc., who crossed their fingers can now see for themselves on the office wall of State Forester B. M. Lufburrow, the beautiful head of a buck with the ten point antlers.

The head and the soft skin, beautifully taxidermed, are part of the State Forester's Christmas holiday kill, the edible portions of which went into the famous venison banquet given by Mr. and Mrs. Lufburrow and greatly enjoyed by the forestry force.

SOIL EROSION SERVICE MERGED INTO U.S.D.A.

Effective April 1, all soil erosion work of the federal government is now in the hands of a soil erosion unit of the United States Department of Agriculture, with H. H. Bennett in charge. Previously, soil erosion work was carried on by both the Department of Interior and the Department of Agriculture.

H. H. Bennett, for many years with the Bureau of Chemistry and Soils of the Department of Agriculture, is known throughout the country for his long and militant campaign to control soil erosion in the United States. His addresses and his writings, more than any other's, have brought the country to a realization of the serious situation created by unrestrained soil erosion, and he was the logical person to head the new organization. He is a native of Wadesboro, North Carolina, and owns a farm near that place.

OLDEST U. S. INDUSTRY NAVAL STORES PRODUCTION

The first settlers of this country who landed at Jamestown, Va., in 1607—328 years ago—were under commission to produce tar and timber for the English nation which had depended upon Mediterranean countries and felt the need of being independent of that supply.

Today "naval stores" means resin and turpentine, the center of the industry being Georgia, and the greatest naval stores market in the world, Savannah.

NAVAL STORES HANDBOOK ISSUED BY GOVERNMENT

"A Naval Stores Handbook", dealing with the production of pine gum or oleoresin, is the title of Miscellaneous Publication No. 209 of the United States Department of Agriculture, a publication edited and written in part by Dr. Eloise Gerry of the Forest Products Laboratory, Madison, Wisconsin.

Miss Gerry is well known in the south, where she has worked on gum production with representatives of the forest service, carrying on field tests and studies.

The handbook is considered the best of its kind; it is clear in its presentation and full of useful information, and will doubtless be in great demand in the south.

Pine, Georgia's State Tree

The recent session of the General Assembly, complying with the request of the Georgia Garden Clubs and a petition from schools of the state, designated the pine as the Georgia tree and the brown thrasher as the state bird.

No one species of pine was designated under the legislative bill.

"To write a song hit, take something composed by one of the masters and decompose it."

NAVAL STORES UNDER "NEW DEAL"

Discussing the application of AAA and the use of the Commodity Credit Corporation in the naval stores industry for the past year, H. L. Kayton, president of the Carson Naval Stores Company, Savannah, says they have resulted in large quantities of naval stores being hypothecated under CCC loans, with considerable carry over that is visible, but in strong hands. He says "Production control for the coming year will be much more effective and the incoming crop will probably not exceed the volume set by the control committee."

J. Cheshire Nash, president of the Columbia Naval Stores Company, Savannah, speaks of the many changes from the standpoint of dealers, brought about during the year, calling for complete readjustments. Adjusted production and governmental loans with a known minimum price has made the market less speculative, but has restricted exports as compared to the free outlet of European crops, thereby decreasing the visible supply of American products and increasing the visible supply of Europe.

Mr. Nash calls attention to the fact that beginning with March 20, due to governmental insistence, all receipts at Savannah and Jacksonville must be offered over the Boards of Trades of these two cities. This makes these markets more representative. This he considers a distinct forward step.

NATIONAL PARK SERVICE REGIONAL OFFICE, ATLANTA

Regional office number 4 of the National Park Service has been established in Atlanta with J. H. Gadsby in charge. The region embraces Tennessee, Georgia, Florida, Alabama, Mississippi and Louisiana. Offices are located in the Glenn building, corner Marietta and Spring streets.

J. H. Gadsby, formerly an inspector with headquarters in Atlanta, established such an excellent reputation in his work with parks and recreational areas as to secure his appointment to his present position.

Mr. Gadsby has inspectors located at Jackson, Mississippi; Macon, Georgia; Sebring, Florida; Nashville and Knoxville, Tennessee, and at Montgomery, Alabama.

Notions About Shelter Belt Seedlings

Should tree seedlings to be planted in the semi-arid west for the proposed shelter belt, be grown under dry conditions? This is a mooted question among tree nurserymen.

Those who believe the seedlings should be nurtured in an environment as much like that in which they are to be planted as possible, claim that the nursery beds should never be watered, nor shade given. The idea seems to be that they should never experience anything but hardships, so as to prepare them for struggles with thirsty lands and scorching winds.

CCC PERMANENT RELIEF MEASURE RECOMMENDED

"The CCC has proved so effective as a relief and conservation agency that I recommended it be made a permanent part of the federal establishment," says Robert Fechner, Director of the Civilian Conservation Corps.

"Viewed on a nation-wide basis, the Corps has proved a social and economic success. It has given the American people a new method in combating unemployment and depression. It has demonstrated that large numbers of unskilled young men can be put to work at short notice on constructive forestry and conservation projects that are productive of lasting benefits not only to the men themselves but to the economic life of the state and nation. The Civilian Conservation Corps is described by the Labor Department as 'the most beneficial and constructive movement for the welfare of youth of these times.' It has given foresters—both federal and state—their greatest conservation opportunity in a generation."

FOREST FIRES DESTROY TROUT IN STREAMS

The waters of good trout streams are normally slightly acid in content. When a conflagration sweeps through timber stands, hundreds of tons of ashes fall to the ground. Rains later wash the ashes into the streams. What is the result? Well, not exactly what might be expected. It is not so much the particles of ash present in the water which physically interfere with the fish life, although that effect is harmful too. There is a more subtle, an even more important effect.

The ashes are alkali in content. When washed into the small trout streams they change the normally slight acidity of the water to an alkaline condition. The result is hundreds, perhaps thousands, of dead fish.—Service Letter (Pa.).

CCC Deeds of Valor

Exceptional cases of bravery on the part of Civilian Conservation Corps enrollees will be recognized by the award of a special certificate for valor.

Awards will be made by Director of Emergency Conservation Work, Robert Fechner, upon recommendation of the company commander, supported by the evidence of eye witnesses.

CCC Men Attend Classes

Fifty-three per cent of the CCC men now in camps have enrolled in educational classes conducted by camp educational supervisors, says Director Robert Fechner.

According to the popularity of the courses, vocational teaching is first with 43 per cent. Others in their order are as follows: 18 per cent elementary work; 32 per cent high school; 5 per cent college work and 2 per cent general.

DR. HERTY HONORED

Dr. Charles H. Herty, friend of southern pines, was honored April 15 at Statesboro with a celebration sponsored by the Statesboro Chamber of Commerce. It was at Statesboro, several years ago as a representative of the United States Forest Service, he discovered methods of turpentinizing that revolutionized the industry and brought into use the Herty cup.

Nantucket Tip Moth

One of the tip moths that is destructive to loblolly and shortleaf, but not to slash and longleaf pines, is the Nantucket tip moth (*Rhyacionia frustrana*). The insect is described by Philip C. Wakeley in a paper issued by the Southern Forest Experiment Station. Heavy damage is recorded in Louisiana, where studies were made.

Damage occurs in buds and twigs of young pines. Four generations a season are reported. Less damage results in thick stands, and still less danger exists where pines are in mixed stands. Even-age stands, both artificially planted and natural reproduction, suffers most, leading the author to doubt the advisability of establishing large, pure, even-aged stands of loblolly or shortleaf pines.

Wood Flour Rubber

As much as 50 per cent of the material one regards as rubber may be made of wood flour. Hard rubber of all kinds generally contains large proportions of finely ground wood.

White pine is most commonly used to make wood flour. Several grindings and screenings are required.

"So your matrimonial life has been unhappy! What was the trouble? Was it December married to May?"

"Lan' sakes, no, jedge, it was jes' Labor Day married to de Day ob Rest'.

Husband and wife were driving along a lonely road. They had been in a hot argument. A mule brayed.

"One of your relatives", he commented. "Yes, by marriage", was her retort.

Another thing: If you want wild flowers in the woods, keep out fires.

Attend the annual meeting of the Georgia Forestry Association at Macon May 17-18, and become forestry minded.

"Control burning" is a good way to kill your children's tree crop.

Saving the land from washing and the forests from burning are vital to sustenance and housing of all the people. No wonder relief measures aimed at these resources are popular.

The spring floods have borne away in muddy waters millions of tons of plant food from unprotected soils.

FIRST DISTRICT

Russell Franklin, Dist. Forester
Rome

T.P.O. Items

Officials of Cherokee county called a meeting at the courthouse in Canton in the interest of forming a timber protective organization in that county. Some twenty-five business men attended the meeting and it was decided to send out notices for a meeting on April 23rd, to every land owner in Cherokee county. The county commissioner signified his willingness to cooperate with the land owners by contributing the equivalent of \$600. a year toward the salary of a secretary-manager for the county, this secretary-manager to direct the activities of the T. P. O.

Gilmer County T.P.O.

The Gilmer County T. P. O. is gradually being enlarged to cover portions of adjoining counties. This T. P. O. was originally planned to just cover Gilmer county, but so many landowners have expressed a desire to enter this T. P. O. that it was decided to enlarge it so as to take in those other counties bordering on Gilmer. This T. P. O. now has three towers with telephone connections and is carrying on year-round protection work.

FOURTH DISTRICT

W. G. Wallace, District Forester
Columbus

Vocational Forestry News

Much of interest was noted on final visits to vocational school forest projects. Outstanding were the accomplishments of the Hogansville High School, with Claude Bray as teacher of vocational agriculture.

Students and teacher at Hogansville have used Saturdays and other available time to construct a lake and log cabin on their school forest. Early indications are that there will be quite a local demand for these recreational facilities by various civic clubs and other local organizations. Mr. Bray thinks the forestry club will be able to make a few badly needed dollars by renting its cabin on various occasions. The whole project has been a demonstration of what can be accomplished by a bunch of good fellows working together for a common cause. Mr. Bray and his students are to be commended for their many other projects and activities in addition to the cabin and lake.

On the whole, I am disappointed at the seeming lack of interest taken by the students of this district in their home forest projects. These home projects really offer

the best opportunities for practicing what is learned in the classroom, and at the same time the students have more reason to take a deep personal interest in their home projects due to each home project being a demonstration of the students' initiative and ability. The student, in most cases, is also the one who more than likely will receive the most benefit from improved forests for he expects to some day own and operate that farm.

I was particularly interested in the home project of a student from Preston High School in Webster County, Mr. T. E. Ritchie, vocational teacher. This student, sorry I don't know his name, planted an old field with cedar seedlings dug from the woods. He started this project a year or two ago and is adding to it each year. His trees are growing nicely, and with the initial investment of a little work, which by the way never hurt anyone, this young man expects to have a valuable growing capital in the form of growing trees. We know he will get much pleasure as well as profit from this project, and think what a satisfaction it will be to him to know that he has transformed a piece of unproductive field into a profitable venture, and has checked soil erosion at the same time. I certainly hope more boys will plan worthwhile home projects next school year.

Ananias, Page "Brigham" Young

The more we think about it the more suspicious we get about that fishing trip "Brigham" Young told about in the April Review—you know, the one where the fog got pretty "thick". We know "Brigham" for his modesty and we also know him to be a man whose veracity is unquestionable—that is, we thought so. All we've got to say, Brigham, is save us some of that mountain dew, oh, I beg your pardon—fog, I mean. We're coming up to fish in Lake Burton some time too, and we sure want the fish to be biting, yes, I'm speaking of that rare species of flying fish.

SIXTH DISTRICT

Jack Thurmond, Dist. Forester
Savannah

Ocmulgee T. P. O.

The Board of Directors, with the approval of the Forest Service, hired a full time ranger for the Ocmulgee T. P. O.

Eugene Thomas is the new ranger and assumed his new duties on April 1st and he is now busy signing up new members, collecting assessments and working up a bigger and better T. P. O.

The Ocmulgee T. P. O. is composed of lands formerly in the Ocmulgee, Little River and Dodge T. P. O.'s, which were consolidated into one organization and now contains 150,000 acres. The assessment is 2½c per acre.

A five tower detection system is being installed and in addition, 150 miles of telephone line will be constructed to connect the towers and available fire fighting forces.

Liberty T. P. O.

The officers of the Liberty T. P. O., with the approval of the Forest Service, put on a full time ranger, R. E. Banks, Jr. The ranger is now working on signing up new members, blocking in existing T. P. O. lands in order to make the T. P. O. area as compact as possible and at the same time, collecting the assessments.

It is hoped and plans are being made to construct two more towers in this area, one near Willie and another near Walthourville; also sufficient telephone lines will be constructed to connect the two new towers with the present detection system.

A meeting will be held soon to consolidate the Liberty and Long T. P. O.'s, which will be covered by a five tower system.

New T. P. O.

At a recent meeting of timber landowners in Metter, a T. P. O. was formed. The new T. P. O. will operate under the name of Canoochee T. P. O. and cover lands in Candler and Northeastern Tattnall County.

A Board of Directors was elected and the members are as follows: W. J. Brannen, President of the T. P. O. and Chairman; A. J. Bird, vice-president; Fred Miller, secretary-treasurer; J. I. Dekle and J. B. Holloway, members at large.

The Board of Directors agreed to hire a full time ranger and as soon as he has been approved by the Forest Service, will begin his work of perfecting the organization by signing new members and collecting the assessments.

E. C. W. Notes

The three 100 foot, steel lookout towers purchased by Emanuel T. P. O. will all soon be erected. Work on them is progressing very rapidly and is being done by men at P-61 Side Camp, located in Swainsboro.

Mr. J. B. Lattay, formerly E. C. W. Forester for the Savannah District and later used in the Waycross District on type map work, has accepted a position as District Forester for the North Carolina Department of Conservation and Development.

Mr. Lattay will be located at New Bern, N. C., or in a nearby district. We are sorry to see Mr. Lattay leave Georgia but hope he likes his new work.

"What's this big item on your expense account?"

"Oh, that's my hotel bill."

"Well, don't buy any more hotels."

FORESTRY EXAMINATION QUESTIONS FOR CAMP SCHOLARSHIPS

Students of Vocational Agricultural Schools Stood Tests April 20 at County Seats

- 1—Name fifteen species of trees in your community.
- 2—Name leaf characteristics of (a) Slash pine; (b) Longleaf pine; (c) Loblolly pine; (d) Shortleaf pine.
- 3—What species of pine are used for naval stores? Where do they grow in Georgia?
- 4—Describe methods of planting pine: (a) Ground preparation; (b) spacing of planted seedlings; (c) care of seedlings after their removal from the nursery until they are planted; (d) how the seedlings should be placed in the ground.
- 5—Give main reasons for keeping fire out of the woods.
- 6—What general rules would you follow in improving and thinning an overstocked stand of pines that are 4 or more inches in diameter? How would you dispose of the thinnings?
- 7—How would you collect, thresh and care for pine seed?
- 8—What hardwoods would you cut for making (a) handles; (b) staves for barrels; (c) fence posts?
- 9—In planning land use on a farm, what areas would you use for growing trees?
- 10—How do forests influence water flow: (a) erosion; (b) stream flow; (c) water power?
- 11—Why should a farmer know how to practice good forestry methods?
- 12—Describe your home forestry project.

MAY FOREST ATTRACTIONS LURE OF STATE PARKS

Forests in May are at the height of their beauty in upper Georgia, while April in lower Georgia finds the bloom of trees, shrubs and wild flowers at their best.

Autoists and hikers will find May and June vegetation especially attractive in the mountains, where rhododendron, kalmia and azaleas, and many wild flowers are in bloom.

A trip to Vogel Park on the crest of Blue Ridge Mountain will give anyone a rich experience. Picturesque scenes, brilliant coloring of the forest flora, the elevation and change of one's daily circumstances, all will contribute recreational values to anyone's life.

Those who visit the park will see the new work of the CCC, making the park one of which the state will be justly proud.

Perhaps it is more convenient to visit Indian Springs Park, the historic place in

middle Georgia where great transformations have occurred under the CCC program of work. Indian Springs is a choice spot of natural beauty.

For those who find it more convenient, a day at Alexander H. Stephens Memorial Park, Crawfordville, will be found most interesting. Here too, the landscape artists and CCC men have been restoring and have been creating a new surround park area. Inspiration from the life of a great man and from nature await the visitor.

Fort Mountain Park, beautiful for location, with scenic approach and sweeping views from the mountain should be the mecca of many. It is under construction, and when completed will be most intriguing because of the mysterious fort, as well as one of the most attractive in the state.

Not all the mountains of Georgia are in its northern area. Pine Mountain is in middle Georgia and has its Pine Mountain Park near Warm Springs. This is another new park under construction. Though incomplete, it is a place well worth visiting this summer.

Santo Domingo Park, near Brunswick, historic, with the natural beauty of the Coastal Plains, now in course of construction and beautification, and eventually to be a choice show place of the state, is calling to those seeking recreation, enjoyment and inspiration.

Other park sites selected, but not yet developed, are near McRae and Albany in south Georgia.

Clarke-McNary Allotment Not Correctly Interpreted

In the April issue of this publication a statement put out by the U. S. Forest Service Regional Office in Atlanta concerning the allotment of Clarke-McNary funds for Georgia, was misconstrued. Instead of the sum of \$146,855 all being made available to the Georgia Forest Service in its administration of Clarke-McNary funds, only a part of it is available. The sum mentioned included state, federal and private land owner allotments instead of state alone.

The world production of rayon yarn during the year of 1934 has been estimated at 788,855,000 pounds. The United States headed the list with over 210,000,000 pounds.

An act is pending in Congress whereby the federal government may purchase lands for state forests, holding the title till the states acquire them.

YEAH, COME ACROSS

He—"Will you marry me?"

Heiress—"No, I'm afraid not."

He—"Oh, come on, be a support."

ARCHAEOLOGISTS MET AT ELBERTON

The Spring meeting of the Society for Georgia Archaeology was held Saturday, April 6th, at Elberton. In spite of threatening weather and muddy roads, about 25 members and guests visited the Indian mounds and village site near the junction of the Savannah and Broad rivers 15 miles southeast of Elberton, and collected a large study collection of broken pottery for comparison with that found at other village sites in the state.

Dr. C. C. Harrold of Macon, president of the society, was toastmaster and Dr. R. P. Wright, of Erie, Pennsylvania, president of the Pennsylvania Archaeological Association, was guest of honor, at a dinner at the Samuel Elbert hotel. The dinner was followed by a meeting at the Elberton Chamber of Commerce at which Dr. A. R. Kelley gave an illustrated talk on the discoveries at the Indian mounds at Macon, including the now famous council house, buried Indian cornfield, and pit houses.

March Publication of U. S. Bureau of Mines of Interest to Georgia Mineral Producers

Information Circulars:

6155. Clay, by Paul M. Tyler. 66 pp. (revised edition).

6825. Summary of drifting and cross-cutting cost data, by C. F. Jackson. 14 pp., 17 figs.

6826. Sand and gravel excavation—Pt. 3: Hydraulic dredge, clamshell dredge, ladder dredge, and dipper dredge. 36 pp. 8 fig.

6835. Review of literature on effects of breathing dusts with special reference to silicosis, by D. Harrington and Sara J. Davenport. 68 pp.

These may be obtained free of charge on application to Information Division, U. S. Bureau of Mines, Washington, D. C.

CCC MEN REDUCE INCENDIARY FOREST FIRES

Incendiary fires in national forests have been reduced nearly 50 percent since the organization of the Civilian Conservation Corps, according to a report forwarded by F. A. Silcox, Chief Forester of the United States Forest Service, to Robert Fechner, Director of Emergency Conservation work.

"The presence of the Civilian Conservation Corps as an organized firefighting unit has largely reduced the temptation to set fires for the sake of employment", says Mr. Silcox. "In the past many incendiary fires have been set by those who hoped to earn a few dollars of government money in putting them out.

"Incidental to the maintenance and operation of the CCC camps, a large number of both Army and Forest Service trucks have been traveling the roads day and night. Each driver is a patrolman in fact and a deterrent to the incendiary."

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

STONE MOUNTAIN, GEORGIA

Geoffrey W. Crickmay

Of all the scenic features of Georgia, Stone Mountain, situated 16 miles east of Atlanta, is not only the best known but is by far the most distinctive. In form, the mountain is an elongate dome of nearly bare granite more than 650 feet high, approximately one and a half miles long and three quarters of a mile wide, with the longer axis in a northwesterly direction. The south side of the dome is a moderately steep slope but the north side is a precipitous and imposing cliff. The accompanying block diagram is a birds-eye view of the mountain as seen from the east. In or-

country surrounding the mountain appears to be a relatively flat plain stretching out on all sides as far as the eye can see. The plain is actually a rolling upland, the Atlanta Plateau, whose altitude ranges from 1000 to 1100 feet. The plateau is underlain by banded rocks, most of them very micaeous, which are far different from the massive granite of the mountain. The banded rocks, or gneisses as they are called, are much less resistant to erosion than granite and it is for this reason that they have been worn down by meandering streams in ages past, leaving the more durable granite as a prominence.

The granite, however, is not by any means immune to the destructive action of

through hydration which causes a disruption of the mineral grains. The loosened grains are washed away by heavy rains or perhaps to a small extent are blown away by winds. The radially striped pattern of the mountain's surface is due to rainwash which carries down iron oxides and organic matter to stain the slopes. Rainwash, however, has practically no erosive power as is shown by the fact that rill-ways are crossed by thin delicate walls of granite and have irregularly pitted surfaces quite unlike the smooth surfaces produced by stream erosion. The channels, like the weather pits, are almost entirely the result of disintegration due to hydration.

Exfoliation is another superficial feature that appears to be due to weathering, although the exact manner in which it develops is somewhat obscure. The entire surface of the mountain is made up of granite layers, called exfoliation shells, concentrically arranged to conform to the surface of the dome. In places the shells have been partially peeled off by the natural quarrying of tree roots and other agencies but, contrary to popular belief,

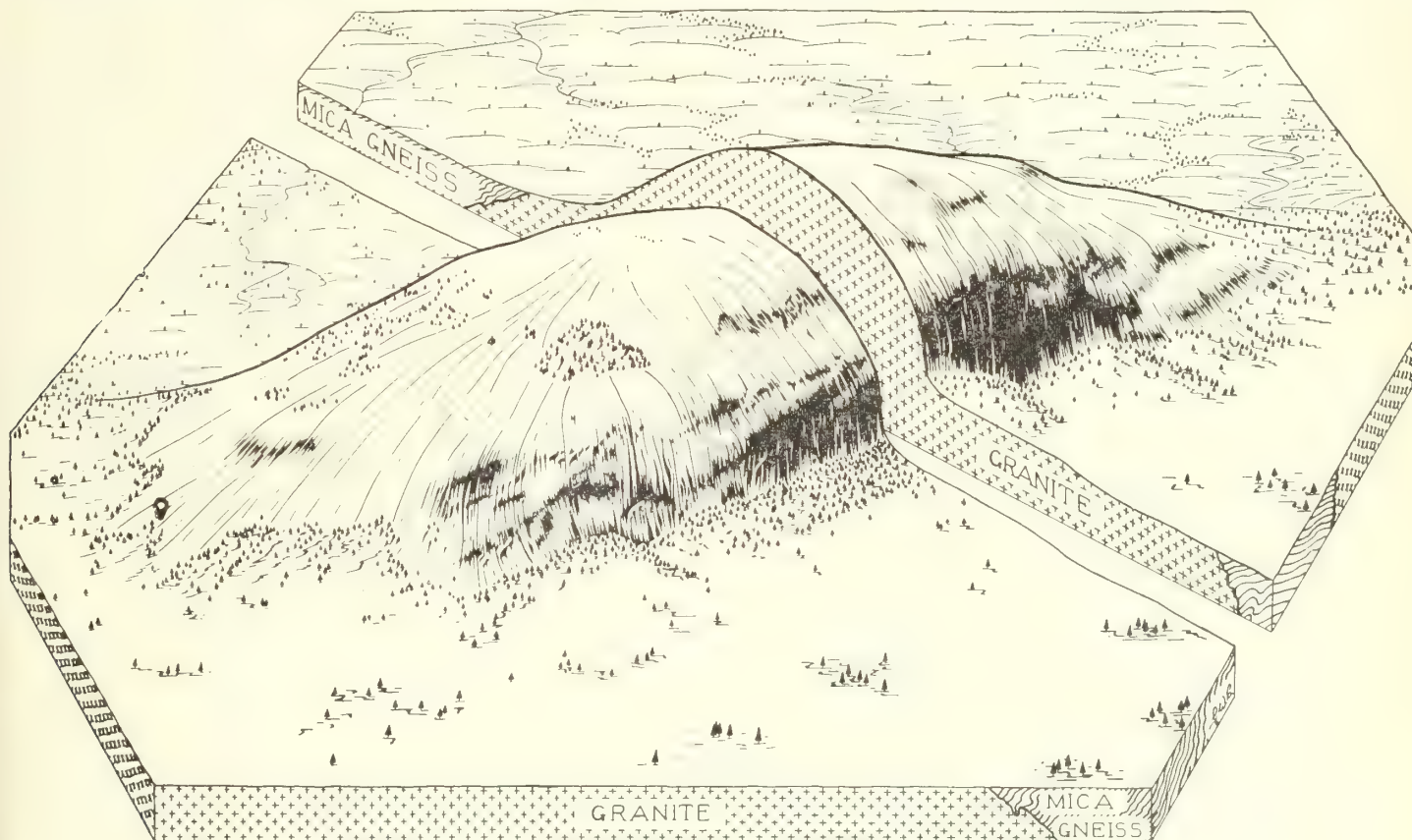


Figure 1—Block diagram of Stone Mountain as viewed from the east, showing geologic structure on sides and on cross section.

der to show the geologic structure the block has been cut in half and pulled apart.

Stone Mountain is climbed by a trail that follows the long axis of the dome from a point on the highway near the northwest end, one mile east of the town of Stone Mountain. The crest, which is marked by an airplane beacon and a U. S. Coast and Geodetic Survey monument, has an altitude of 1686 feet. From this vantage point, the

the weather. Irregularities, ranging from broad saucer-shaped depressions to pits resembling the pot-holes of stream channels, dimple the surface of the mountain, particularly the upper slopes. Rain water that collects in these depressions causes a partial decomposition of minerals which so weakens the rock that it readily crumbles to a sand. The rotting of stone by water appears to be due to an increase of volume

the configuration of the dome is not determined by exfoliation, as demonstrated by two facts. There is practically no debris at the base of the mountain where such blocks would be expected to fall and collect as talus. The slabs that appear to be perilously near falling down the mountain side are etched by weather pits showing that they have been there a very long time and in all probability will remain in their pre-

carious positions for a long time to come.

Stone Mountain, whose volume is roughly twenty billion cubic feet and whose weight exceeds a billion and a half tons, is only a small part of a much larger mass of granite which occupies an oval area measuring five miles in length and two miles in width. This great body of granite was intruded as a molten rock into the surrounding gneisses as a batholith, a name applied to all large masses of intrusive rock. The term batholith means simply "depth-rock", corresponding to bathosphere or "depth-sphere", and implies that the rock crystallized at great depth, perhaps half a mile or more below the ground surface. The Stone Mountain batholith is relatively small compared to some other batholiths of the state.

When the molten rock, or magma as it is called, was forced up from deep within the earth, the gneisses of the Atlanta Plateau must have covered the present site of the mountain for otherwise the magma would have chilled and cooled so quickly that it would have become glassy instead of coarsely crystalline. It would, in other words, have looked more like lava than granite. But the roof of the batholith was not very strong for blocks were worked loose and sank into the invading magma. A few of these blocks, frozen in the granite as it were, are to be found on the mountain side to prove the nature of the overlying rocks that have been entirely removed by erosion.

As the magma slowly cooled crystals started to form, much like the sugar crystals that form in honey, until finally all the upper part of the batholith became solid granite, except for the so-called "granite juices" which remained liquid only by virtue of their high content of water and dissolved gases. These "juices" possessed a remarkable power of penetration for they found their way into all the cracks and joints that developed in the cooling granite and even wedged their way between the individual mineral grains of the rock. Minerals crystallizing from the "juices" as veins, formed a new rock known as pegmatite, which differs from the granite mainly in being very much coarser grained. The pegmatites of Stone Mountain are characterized by the mineral tourmaline which contains the gas boron as an essential part of its composition. Veins of pegmatite are well displayed in an old quarry where the trail starts its ascent of the mountain.

The Stone Mountain granite is a coarse-grained, grey rock composed mainly of four minerals, feldspar, quartz, biotite or black mica, and muscovite or white mica, named in the order of decreasing abundance. The remarkably uniform character of the granite and the complete absence of iron sulphides are qualities that make Stone Mountain granite a structural stone unexcelled anywhere. The stone has been quarried intermittently since 1845 but the ear-

ly operations were confined to easily accessible ledges of partly decomposed granite. The use of this inferior stone led to an unwarranted condemnation of all southern granites by many builders. This early prejudice has now been entirely removed by modern quarrying methods in which all unsound surface stone is discarded and granite production has come to be one of the state's leading mineral industries. The most extensive quarries are located on the south side of the dome. Here the exfoliation planes, conforming to the slope of the mountain, are cut by a well defined set of vertical joints, thus greatly facilitating the easy quarrying of the stone.

The mineral collector will find many specimens at Stone Mountain to enrich his cabinet. Besides the relatively common feldspar, quartz and mica, the following more uncommon minerals are to be found:

Tourmaline is a black aluminum silicate containing boron and hydrogen. The mineral occurs in pegmatite veins and as radiating groups of crystals in the granite. These tourmaline "knots" are characteristic of Stone Mountain granite and as the mineral is quite stable their presence is in no way detrimental. Some of the tourmaline crystals attain considerable size—one specimen was found with a length of more than a foot and a half. Very rarely the tourmaline is found in very fine-grained, narrow veinlets.

Garnet is a pink to red iron aluminum silicate. It occurs in small but distinct crystals in some of the pegmatites and in a dense form in narrow veinlets. The mineral is most abundant in the quarries on the south side of the mountain.

Uranophane is a calcium uranium silicate of canary yellow color. It occurs as a coating on the surfaces of major joints associated with a glassy variety of opal known as **hyalite**. The radium content of the granite, which has been found to be greater than that of any other granite in the eastern United States, is thought to be related to the abundance of uranophane. Spring water from near the base of the mountain is also found to be unusually radioactive.

New Director, Forest Experiment Station, Asheville

C. L. Forsling has succeeded E. H. Frothingham as director of the Southern Appalachian Experiment Station at Asheville, N. C. Mr. Forsling was formerly director of the Inter-mountain Experiment Station at Ogden, Utah, with 20 years experience in the U. S. Forest Service.

C. H. Carson, vice president of the Carson Naval Stores Company of Savannah and Jacksonville, has been selected chairman of the Naval Stores Section of the Savannah Chamber of Commerce. C. T. Theus of the Farie Naval Stores Company, Savannah, was elected vice chairman.

FROM A GEOLOGIST'S NOTEBOOK

Richard W. Smith, State Geologist, has been appointed to serve on the Executive Council of the newly organized Industrial Minerals Division of the American Institute of Mining and Metallurgical Engineers. This division is composed of members of the Institute interested in nonmetallic minerals.

Of interest to Georgia's gold miners is an article in the April, 1935 issue of Mining and Metallurgy (Amer. Inst. of Mining and Metallurgical Eng., 29 W. 39th St., New York, N. Y., \$.50) on "Problems in the Flotation of Gold", by R. A. Pallanch of the U. S. Smelting, Refining and Milling Co.

The United Clay Mines Corporation, Trenton, New Jersey, Clyde W. Hall, vice president, has leased the H. A. Walden property on the Central of Georgia Railway near McIntyre, Wilkinson county. This property, according to State Geologist Richard W. Smith, contains a large deposit of soft white kaolin which will be mined and shipped east for use as a paper filler and in the manufacture of white ware products.

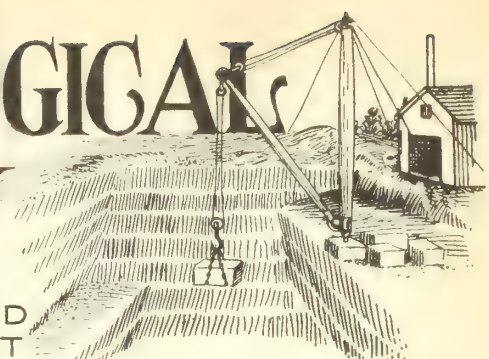
In Justice to Chief Sawnee

An injustice done to a north Georgia mountain in 1887 has just been rectified, according to State Geologist Richard W. Smith. The Department of Forestry and Geological Development has been notified by the Division of Geographic Names of the United States Department of the Interior that it has decided that the official name of the mountain near Cumming in Forsyth county, Georgia, is Sawnee and not "Suwanee" as it is given on the government topographic map of the region made in 1887 by the United States Geological Survey.

This famous landmark of north Georgia, according to Mr. Smith, was named Sawnee's Mountain by the first white settlers after an old Cherokee Indian chief who lived in the vicinity. It went by this name with slight variations in spelling, until the government erroneously gave it the same name as the town of Suwanee on the Southern Railway in Gwinnett county. Both names have appeared in literature since that time, although the local inhabitants have stuck to the name Sawnee. To clear up the confusion, Mr. Smith submitted the evidence on both sides to the Division of Geographic Names, which decided that the original name of Sawnee shall henceforth be used.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



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No. 6

GEORGIA FORESTRY ASSOCIATION VIGOROUSLY PROTESTS FOREST BURNING

FAVORS CARPET GRASS DEMONSTRATIONS AS SILVICULTURE MEASURE IN GEORGIA

Largest Attended of the Fourteen Annual Meetings — Keen Interest Is Shown in Varied Program—Robert Fechner Welcome Guest and Speaker Warned Georgia it must Support CCC Work or Lose it — Bonnell Stone to be Honored with Tablet at Vogel Park—Exhibits a Feature of the Convention—T. G. Woolford Re-elected President — Columbus next Meeting Place.

The fourteenth annual session of the Georgia Forestry Association, held at Macon May 17-18, was the most largely attended, and in many respects the most successful in the history of the association. All parts of the state were represented. Important issues were handled frankly and fearlessly, and the audience reacted with enthusiasm.

Organized forest fire prevention was the keynote of the meeting, and no one present was left in doubt of the fact that Georgia forest leaders are very definitely opposed to burning the woods, and are enthusiastically in favor of extending the timber protective organization of the state. Further, a resolution rebuked those who had advocated burning the woods, and according to claims of more than one speaker, such advice was responsible for the heaviest fire loss the state has ever suffered.

The association is strongly opposed to federal acquisition of commercial forest lands for commercial development, a position clearly defined in resolutions adopted at previous meetings. A vigorous address by A. G. T. Moore of the Southern Pine Association, New Orleans, assailed federal acquisition as a step toward putting the federal government into unfair competition with private land owners. Robert Fechner, Director of Emergency Conservation Work, took issue with some of the statements of Mr. Moore, saying that it was the purpose of President Roosevelt to be helpful; that he is seeking to protect watersheds to the end that destruction by erosion and floods may be lessened; that his purpose is to recover for public benefit cut-over, abandon-

ed and sub-marginal lands that the owners are unable to improve, and that, as shown by the low cost at which the lands are purchased, valuable commercial forests are not an objective of the federal purchase program.

Carpet grass to supplant wiregrass and sedge grass of the forests, as a means of lessening forest fire hazards and to improve grazing, was a subject of keen interest. Agricultural representatives from Georgia and other southern states were there to confer with Robert Fechner and federal forestry officials to see if CCC labor could be used in carrying out large-scale demonstrations in modifying the herbaceous growth of the forest. Whether the act under which emergency conservation forestry work on privately owned forests would admit of CCC labor for carpet grass planting was raised and stood in the way of definite commitment to the undertaking.

Hon. Bonnell Stone, founder, promoter and secretary of the Georgia Forestry Association, prominent in advancing every interest of forestry in Georgia for the first time unable on account of illness to attend the meeting, was eulogized by speakers who proposed a substantial token of esteem by suggesting a free will offering to establish a suitable tablet at Vogel Park

(Continued on Page 2, Col. 2)

As this edition of the Forestry-Geological Review goes to press, the death of Bonnell Stone at Oxford, Georgia, is received. The July edition will give a full account.

CAMP SCHOLARSHIP WINNERS VOCATIONAL AGRICULTURAL STUDENTS

Contest to Attend the Annual Vocational Forestry Camp—Greater Number try for Scholarship than Ever Before

On April 20, 251 vocational agricultural students stood final examination to obtain scholarships entitling them to attend the annual vocational forestry school camp conducted jointly by the Georgia Forest Service and the Vocational department of the state Department of Education. The fifth of such camps is scheduled to be held this summer at a time and place to be announced later.

One scholarship goes to each county having vocational agricultural teachers. Previous to the final examination, the teachers conducted elimination examinations to the point of determining the three best in each school to stand the county wide final test.

The Educational Manager of the Georgia Forest Service graded the papers, but the teachers were required to also grade students on the basis of 10 points for moral character and 10 points for general scholarship and interest in forestry. As a result of this system of grading, the camps have always drawn the finest types of young men.

This year a number of new schools, located in counties hitherto without such schools, entered the lists, and most of them, according to the Educational Manager, have made good showings.

A camp scholarship means to the winner two summer camp sessions of three weeks each, free of cost, and a certificate of vocational forester after a successful completion of the course.

The Georgia Forestry Association has fostered the forestry project in the rural consolidated high schools having vocational agricultural teachers by offering annually a prize to the teacher doing the best work in forestry, and \$50 to the student making the best record in the forestry camp.

The scholarship winners for the 1934-35 school year are as follows:

Bacon county, Vernon Deen, Alma; Bak-

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State Capitol, Atlanta
C. A. WHITTLE, Editor

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er county, Chester Kelley, Elmodel; Barrow county, Gus Johnson, Winder; Ben Hill county, Jesse Reeves, Fitzgerald; Bulloch county, Carroll Dekle, Register; Brooks county, Ralph Scruggs, Morven; Burke county, Henry Cochran, Girard; Berrien county, Leon Singletary, Route 4, Nashville; Chattahoochee county, Johnnie Gallops, Cusseta; Chattooga county, Dorsey Hawkins, Gore; Clarke county, Parks Lanier, RFD 3, Athens; Clay county, Edward Lee Roberts, Fort Gaines; Colquitt county, Paul Beck, Moultrie; Cook county, Paul Barrett, Sparks; Crawford county, Lawton Burnette, Roberta.

Decatur county, Wallace Brock, Climax; Dawson county, Joe Dan Cox, Dawsonville; DeKalb county, Wiley K. Smith, Decatur; Early county, Marion Pullen, Damascus; Emanuel county, Garland Black, Swainsboro; Fannin county, Willie Tranthem, Epworth; Floyd county, Ernest Carnet, Route 1, Armuchee; Franklin county, Fred Brown, Carnesville; Fulton county, Hugh Trammel, Alpharetta; Gilmer county, Arvil Parks, Ellijay; Gordon county, Wilmon Bohanan, Calhoun; Gwinnett county, William Dalton, Dacula; Hall county, Delmar Lee, Oakwood; Habersham county, John H. Sanders, Baldwin.

Hart county, Joe Mann, Hartwell; Heard county, Ray S. Stephens, Franklin; Irwin county, Wallace Childs, Chula; Jackson county, George Pool, Commerce; Jefferson county, Austin Rheney, Wrens; Johnson county, Garnette Stephens, Kite; Laurens county, Bennett Colyer, Cadwell; Long county, Leon Brewer, Ludowici; Madison county, Jack Veatch, Ila; Mitchell county, Allen Crosby, Sale City; Montgomery county, Arthur Lee McKay, Kibbee; Murray county, Sam Jones, Chatsworth;

Newton county, Edward Stone, Oxford; Screven county, Robert Griner, Hiltonia.

Stephens county, Guy Davis, Eastanollee; Stewart county, Philip Turnipseed, Richland; Sumter county, Ellis Clarke, Leslie; Taylor county, Alfred Childres, Jr., Butler; Thomas county, Harold Cooper, Pavo; Tift county, Ramon Harris, Ty Ty; Toombs county, Edwin Winge, Lyons; Troup county, Elmer Covin, Hogansville; Treutlen county, Bill McCrimmon, Soper; Walker county, K. D. Marshall, Ross; Walton county, Madison Smith, Monroe; Ware county, Chester Roberts, Waresboro; Wayne county, J. B. Olliff, Bristol; Wheeler county, Edward L. Cooper, Alamo; White county, Albert Dorsery, Cleveland; Whitfield county, Amos Ray, Dalton; Wilkes county, Joe Bennett, Washington; Worth county, Murray Massey, Sylvester; Webster county, Ralph Wiggins, Preston.

FORESTRY ASSOCIATION

(Continued from Page 1)

commemorative of his valuable service to forestry in Georgia. Those in attendance responded generously and a committee is authorized to place the tablet as soon as it can be procured.

Thanks to John Morris, Manager of the Macon Chamber of Commerce, and his committee, the display of exhibits was the best that has been shown at an annual meeting.

It is gratifying to all friends of forestry that T. G. Woolford consented to continue as president of the association. Other officers were re-elected and the next meeting of the association is to be held at Columbus. Several cities made bids for the convention.

The program was carried out in its entirety, with only one speaker absent, Hon. Ed. Rivers; who had auto difficulties enroute to the meeting that prevented his arrival on time.

SUMMARY OF CONVENTION PROCEEDINGS

The meeting opened with an invocation by Rev. C. Byrd Harbour, followed by a welcome to the city of Macon by Hon. Herbert Smart, Mayor.

Responding to the welcome, Dean Paul Chapman of the State College of Agriculture, Athens, voiced the thanks and appreciation of the entire association to the city of Macon for its hospitality. For the benefit of new members and visitors, he told of the formation of the association fourteen years ago, of how the organization was responsible for the creation of the state forest service, and of all legislation relating to state forestry and of how the organization had given wise counsel and guidance.

The outstanding objectives of the association, he said, are forest fire prevention in the only section of the country where forests are wilfully burned; reforestation of abandoned, cut-over and eroding lands; and promoting the findings of Dr. Herty.

President Woolford's Address

In making his annual report, President Woolford said the association had been through an eventful year in which it had declared itself opposed to federal acquisition of commercial forest lands for commercial development, which had been given wide publicity, and had sought to protect and promote the interests of forestry at a session of the state legislature.

The magnitude of the association's opportunities were shown by the fact that Georgia now has 28,000,000 acres of forest and potential forest land, an increase since 1926 of 5,000,000 acres. Instead of the naval stores industry in Georgia disappearing, according to the Capper Report of 1920, in seven years, it has increased and Georgia is now producing one-third of all naval stores in this country.

Promotion of commercial forestry, according to Mr. Woolford, is the main objective of the association; but parks, recreation, erosion control, all related closely to forestry, were within the scope of the association's active interest.

The association had manifested interest in the movement to supplant wiregrass and sedge grass with carpet grass in south Georgia, and had suggested large scale experiments to forest authorities and favored federal aid in line with Congressman Deen's plans.

The continuation of the forest survey under Capt. I. F. Eldredge had been endorsed and the association had wired Washington in favor of an increase in the appropriation for this important work.

It had been the pleasure of the association to have Chief Forester of the United States, Mr. Silcox, as it guest. Mr. Woolford felt that Mr. Silcox understands the problems of Georgia and is willing to cooperate in their solution.

Gratitude was expressed to the press of the state for its splendid cooperation in combatting the forest fire evil.

Dr. Herty was complimented on the progress of his research. Mr. Woolford figured that Georgia alone was in position to provide for an annual output of 12,600,000 tons of newsprint.

The association had encouraged the T. P. O. and forestry work in schools. Gratification was expressed over the growth and improvement of the School of Forestry at Athens.

The interest of the garden clubs and other women's and civic clubs of Georgia in forestry was pleasing, all showing a growing, constructive interest. He paid a tribute to the great constructive work of the Civilian Conservation Corps, and expressed gratitude to Mr. Robert Fechner for his splendid cooperation.

Forestry in the Schools

Miss Emily Woodward, Vienna, well known journalist and special writer, addressed the convention to make a plea for introducing forestry in the public schools of Georgia.

In dealing with forestry resources, Miss Woodward said that we had failed in being as good Americans and Georgians as we should have been; that in our ignorance we are likely to be misled by people who are most opinionated about things of which they are most ignorant.

She referred in her address to the tragedy of the young pines seared to death as the result of offhand advice of a state official to burn the woods. But for ignorance on matters of forestry, there would have been no unfavorable reaction to the advice.

In the schools, Miss Woodward said, the foundation of an understanding of the forests must be laid, and to this end she pleaded for the introduction of forestry in the textbooks of the state. That the conservation of so important a resource as forests in Georgia is ignored in the school curricula, it was contended, indicated how little thought has been given to educating the needs of the people.

The rich resources of Georgia's pines developed in the past and enlarged by recent research, she claimed, should have been to

object of constructive legislation. The failure had proven a boomerang. The state, she said, had suffered from short sightedness. She plead for an awakening, an education that would not only protect the forests, but promote their economic development and an appreciation of their cultural values.

Georgia's School of Forestry

Speaking on "Georgia's School of Forestry", G. D. Markworth, head of the division of forestry at the University of Georgia, said that his institution was the fifth of its kind to be established in the United States among the 24 now existing; it is seventeenth in the number of graduates and 17th in operating budget; 20th in research, 13th in building space and 14th in size of faculty.

With 42 per cent of the enrollment of the State College of Agriculture forestry students, only 12 per cent of the faculty and 14 per cent of the budget are employed in forestry.

Mr. Markworth said that the school of Forestry had been reorganized and now had one of the best curricula in the country. An objective of the Board of Regents of the University System is to make the School of Forestry a regional institution for the southeast so that one strong institution may take the place of several weak ones.

This concluded the morning session.

Luncheon Program

The luncheon part of the program was to have featured an address by Hon. Ed Rivers, Speaker of the House of the General Assembly, but a wire from Vienna announced car difficulties while enroute which would prevent his arrival on time. President Woolford called on Roland Turner, Atlanta; Dr. W. G. Reed Macon; State Geologist Richard W. Smith, Atlanta; C. A. Whittle, Educational Manager, Georgia Forest Service; Hon. James Fowler, Soperton, and Alex Sessoms, Cogdell, for informal remarks.

ORGANIZED FOREST FIRE PREVENTION

The afternoon program was devoted to organized forest fire prevention, with Dr. Charles H. Herty presiding and the first speaker. He deplored the inexcusable tragedy of the worst forest fires in the history of Georgia this year, a tragedy heightened, he said, by the fact that for the first time in several years Georgia had an abundant longleaf pine seed crop. This burning of the future forest had occurred in spite of pleas carried in the press of the state to protect the forest from fire that the seed crop might germinate. As a consequence of the general burning, the forests had suffered, he said, millions of dollars of loss through the destruction of seedlings and saplings and injury to larger timber, not to include the millions of dollars of potential wealth represented by the destruction of the forest mast.

In discussing why forest fires should be prevented, Dr. Herty referred to cellulose industries and surveyed the progress of work at the Pulp and Paper Laboratory at Savannah. The best paper, it had been found, was made from rapid growing pines. Samples of paper were displayed, showing that paper made from Georgia pines, compared to newsprint used in many leading papers was stronger; that the stiffness of southern pine paper is 76 as compared to 74 used in New York Times. He displayed a rotogravure paper, equal to any except for glass which a suitable calendaring machine could give.

State Forester Lufburrow — The forest area of Georgia properly protected and managed, Mr. Lufburrow said, is capable

of producing raw material valued at \$40,000,000 and manufactured products worth \$150,000,000 annually. Only by cooperation of agencies—federal, state and counties, including educational institutions, county agents, timber protective organizations, naval stores and other private interests, can the fire problem be solved.

In the Coastal Plains, he said, are 14,436,000 acres of forest land; in the Piedmont; 5,091,000 acres of forest land and in the mountain section 3,198,000 acres. It was estimated that through group effort, it will cost 4½ cents per acre annually to protect forest lands in the Coastal Plain; in the Piedmont 2.2 cents per acre; in the mountains, 3.7 cents per acre.

The average annual loss to the state from forest fires has been \$7,000,000 annually, whereas, the cost of protection on the basis mentioned would be \$909,838, a large sum in itself, but the fire loss should also be weighed against a potential income of \$150,000,000 from manufactured forest products.

Authorities, he said, are agreed that 50 per cent of the cost of forest fire protection should be borne by the public, with which aid the timber protective organizations get protection at a minimum cost.

Pulp mills and other forest industries, he said, could not look on Georgia as an ideal place for their operation unless they are assured of adequate forest protection.

The aid rendered by CCC camps has given a great impetus, he said, to forest protection.

The small force and inadequate funds at the disposal of the state forest service, he said, would not have dealt with the fire problem as well as it has except for the aid of cooperating agencies. He said the present fire laws are inadequate and that there is need for better enforcement of existing laws.

C. F. Evans, U. S. Forest Service—Representing the United States Forest Service, Charles F. Evans, Assistant Regional Director, Atlanta, told of federal cooperation with states and private owners in forest fire protection. This cooperation began 24 years ago with the enactment of the Weeks Law and was broadened by the Clarke-McNary Act in 1924 to include all state and private forest land. His opinion was that little progress would have been made in the solution of the forest fire problem had it been left entirely to private initiative.

Most of the southern states, he said, had taken up forestry as a public responsibility only within the last decade. The first development of forest fire control, as expected, occurred in the slash pine belt where returns from forest investments are obtained in a reasonably short period.

In eleven southern states, more than 25 million acres of forest land are under a system of fairly satisfactory fire control, and 28 million acres are under less satisfactory control.

"It is beginning to look as if the tide has turned. One might even hazard the prediction that the time is near when forest land owners will see cooperation and aid instead of being talked into reluctantly cooperating with the state and federal governments," said Mr. Evans.

Mention was made of the loss of interest and discouragement coming with the depression, but how the coming of the CCC camps brought new hope and saved a collapse, Georgia was allotted 30 camps at the outset, 29 of which were on private lands, now reduced to 14 camps. As to how many camps will remain on private lands after the present six-months period, he could not predict.

As a result of CCC work, he said, there had been a striking decrease in fires. The timber protective organizations are much better equipped and more efficient than before.

The wisdom of the investment, he said, depends on the private land owners and the state doing their part from now on in maintaining and making effective use of the improvements.

The main responsibility, he said, rests on the state. The federal allotment to Georgia for forest fire protection under the Clarke-McNary Act is \$62,000. Cooperating forest land owners are spending at least an equal amount and have backed up the CCC work through the purchase of towers, tractors, and other equipment, he said. But the state is spending less than \$20,000 for all fire control work, including supervision of CCC work. "State financial support in Georgia has been so weak that it has been necessary for the federal government to pay the salaries and expenses of certain state employees engaged in the supervision of the camps; otherwise, the work could not have been properly handled."

"I am at a loss to explain why the state does not express its official endorsement of the work in terms of adequate appropriations," said Mr. Evans.

County Agricultural Agent Lundy—For the county agricultural agents of the state, W. A. Lundy, Cordele, expressed the opinion that every county agent recognized the importance of forest fire prevention and the enormity of the educational task involved. Cooperation is the solution, involving irresponsible share-croppers, renters and wage earners.

"A crowd of negro boys, rabbit hunting, can burn up more young pine seedlings than the state forest nursery at Albany can grow in ten years", said Mr. Lundy. "Burning for 'improving' the pastures but in reality destroying the best pasture grasses, had been a problem in south Georgia."

Opportunities for contacting more farmers in the AAA production control had afforded greater opportunities for preaching fire control, and the CCC work had impressed the necessity of forest fire prevention. The work of Dr. Herty had aroused interest in forest protection. "The trouble is we do not have enough land owners living on their own farms", said Mr. Lundy. "It is said the depression really started in 1870 when many of our leading farm families moved to town and left their farms to be operated by overseers and tenants. The problem is sociological, as well as educational," Mr. Lundy said.

But he said it was not a matter about to throw up hands in despair. He told of his experience in Taylor county in cooperation with J. S. Green, a wide awake naval stores man, of community meetings, moving pictures and talks of Extension Forester DuPre Barrett; the organization of a T. P. O. by District Forester Wallace and the resultant CCC camp. Since the advent of the TPO and the CCC, the land is becoming covered with a stand of young pines. Since his transfer to Crisp county, Mr. Lundy said he was undertaking a similar forestry program.

County Commissioner Hudson—On behalf of the county commissioners of Georgia, J. S. Hudson, chairman of the county commissioners of Gilmer county, presented the history of forestry work in his county and the part the county commissioners played. In a mountainous county of 300,000 acres, 90 per cent of which is timbered; with a population of 7,000 and an assessed valuation of \$1,600,000, an indifferent attitude toward the preservation of the

forests existed until 1929, when District Forester W. D. Young stirred up interest that resulted in the formation of a timber protective organization, and the employment of an efficient patrolman.

The assessment of three cents per acre was made and a county-wide educational program inaugurated, and a standing reward for the conviction of those found burning the woods was offered. The TPO area reached 77,135 acres. As an incentive to increase TPO membership, such owners as were unable to pay their assessment were subject to call for fighting fires.

Fortune favored the location of a CCC camp in the county. Interest was stimulated. With the construction of numerous trails, breaks, roads, improved machinery, scientific methods, a competent and enthusiastic personnel, the work advanced far beyond the original plans. The Grand Jury recommended the donation of \$500 a year to the TPO to promote a county-wide forest fire protection program, the first county in the state to make such an appropriation.

As a result, only 1.3 per cent of the total timber area was burned over in 1934, compared to county-wide burning in previous years.

Full credit for the awakening of the county to action was given the state forester and his aids.

Turpentine Operator Green — J. S. Green, Butler, prominent turpentine operator, presented convincing facts and figures to show that the harvest of gum has been greatly increased by keeping fires out of the woods.

"I feel sure that there is not a turpentine operator who will not say that fire does not hurt his production and that it lowers the grade of his rosin," said Mr. Green.

Fire, he said, is responsible for scattered stands of turpentine timber with increased cost of operation; that the fire destroys the forest litter and other vegetation on which trees must obtain plant food; that the moisture in the soil is reduced and that erosion is greater on burned-over land, removing soil from the tree roots.

Only one reason for burning is given, and that is, it will be burned anyway. "But", he said, "should a farmer burn all the houses because one has been burned down?"

By keeping fires out of the forest Mr. Green said he had been able to raise the gum yield over 25 per cent. The average yields had been 35 to 45 barrels per crop in days of burning. Since going to the territory in 1930 he had not burned a single acre. The first year of freedom from fire, the yield was 43 barrels, the second year, 50 barrels.

In spite of efforts, a few thousand trees have been burned and some cups have been lost each year, but he figured he was much better off financially by not burning.

Landowners, he said, had noted the more vigorous growth of trees where fire had been kept out, are sold to forest protection and are starting a movement to stop all woods fires. This, he said, means continuation of operation in the region for many years.

Landowners, he found, are more willing to lease to operators who do not burn and that the turpentine operator stands in his own light who cuts off his future timber by burning.

T. P. O. Representative Oettmeier—Representing the Suwannee Timber Protective Organization of 300,000 acres in southeast Georgia, W. M. Oettmeier, manager of 200,000 acres of timberland belonging to Superior Pine Products Company, gave the

convention an interesting account of how the vast forest area has been protected from fire for the last nine years.

Fire protection, he said, is "forestry" within itself in a region where all that is necessary to get a fully stocked stand is to keep out fire. In the region where 90 per cent of the seedling crop is slash pine, a species easily damaged by even a light fire until they are 8 to 10 feet high, creates a situation to be met only by a highly organized protection system.

Fire detection on the unit is facilitated by four towers where observers are on duty from 9 a. m. to 9 p. m., or longer if conditions warrant. The towers are equipped with fire finders for the quick and exact location of the fire. Five rangers are on constant patrol, and in times of low visibility two additional patrolmen are on duty. These patrolmen can pick up fire fighting crews in a few minutes.

Communication from towers to patrolmen is provided by 90 miles of telephone line. A secondary system is radiophone communication, probably the first to be established on private lands. Fifteen receivers are installed in patrol cars, fire trucks and others. When a fire is reported by the tower and checked for location, the towerman calls the main fire crew. Often the crew is on the way to the fire before the radio call is completed, and the fires are suppressed before they get well under way. During the drouth and high winds, 18 fires burned only 350 acres as a result of the quick means of communication.

Firebreaks, the speaker said, are essential, as a means of checking large fires. Primary firebreaks are 20 foot plowed strips, and secondary firebreaks 6 feet wide. Four thousand miles of the latter have been plowed with 1,000 yet to be constructed.

While it may appear to be an expensive set-up, the expense, he said, is infinitesimal compared to the results obtained.

Land Owner Gaskins — Hon. J. Henry Gaskins, a large land owner in Berrien county, spoke out of his abundant experience in the woods and received the enthusiastic approval of the audience.

Senator Gaskins said he had lived in the woods and at the same place all his life, had seen virgin pine forests, observed the crude boxing methods of turpentering and had as much about forestry been known in the days of his youth as now, the income from the forests could have been larger by hundreds of thousands of dollars.

The practice had been to burn the forest every year to provide fresh grass for livestock; all young timber was burned and killed except on ponds where it was too wet to burn; but for the past ten years they had been trying to keep out fires, with varied success.

"Some landowners practice restricted burning. I say timber is always damaged if burned through by fire, no matter what time you burn, or what method you use. Timber and fire won't mix successfully," said Mr. Gaskins.

By keeping fire out of the woods, he said, it will not be necessary to plant pines. He believed it is necessary to thin pines and advocated thinning when the pines are four to eight years old.

The damage of goats grazing pine buds and the feeding of hogs on the roots of young pines were mentioned. The clearing away from standing trees of parts of trees cut, he insisted, should be carried out, and especially when trees are cut from April to October, to avoid pine beetle damage.

Senator Gaskins hoped that taxes on forest lands would be reduced and believed they would be in the near future.

While cattle pick up slow on rough woods in the spring, Mr. Gaskins said, cattle perish in the early spring trying to feed on the burns where grass is not tall enough to graze.

Concluding, Senator Gaskins said every school should teach forestry, especially as to fire prevention and the moral responsibility of children in preventing fires.

Future Farmer Cates—As a representative of the organization known as the "Future Farmers of America", O. M. Cates, Jr., of Meigs, said forestry was close to his heart. He shuddered to think of what Georgia would be fifty years from now if something is not done to stop forest destruction. In place of stately pines will spring up poverty and desolation, he said.

The Future Farmers, of America, he said, were pronounced enemies of forest fires; they were a band of young men determined to better farm conditions, including the care of the forests. The use of the forest has not drained their wealth, he claimed, near as much as negligence in protecting them.

The nation, he held, needs to compel its citizens to protect forest resources and he thought the future farmer organization could lay the foundation for promoting such a policy. The goal toward which to strive, he said, is to secure protection against fire, to use every bit of a tree that is possible, and to care for the acres from which forests are cut so that there will be future forests.

He plead for all lands not used for agriculture to be allowed to grow trees and this he claimed could be easily accomplished if citizens would join together and cooperate.

A Brilliant Banquet

With President Woolford, full of wit, humor, repartee and improvised poetry, as toastmaster, and with W. T. Anderson, as speaker, aglow with brilliant sallies of wit, rising to heights of eloquence as he acclaimed the glory of the forests, their wealth, the health and happiness they hold in store; his pungent condemnation of the woods burners, all conspired to make an evening of pleasure and inspiration.

The feast of oratory was pleasingly introduced with beautifully rendered vocal selections of Miss Frances Owens, accompanied on the piano by Mrs. Donald Mitchell, Jr., both of Macon.

Another feature of the evening was a tribute to Hon. Bonnell Stone, commonly designated the "Father of Forestry in Georgia", paid by Judge G. Ogden Persons of Forsyth. He proposed a tablet to be placed at Vogel Park, as a perpetual tribute to the state's first citizen in forestry and to honor his persistent, untiring, unselfish and constructive achievements in Georgia forestry.

To this end he suggested a free will offering at the door when the banquet adjourned. A liberal contribution was made and a committee has been authorized to immediately consummate the undertaking.

SATURDAY'S SESSION

Keeping Forests in Private Ownership

A. G. T. Moore, an official of the Southern Pine Association, New Orleans, made a stirring address on keeping forests in private ownership. He inveighed against the federal government's activity in acquiring forest lands and its purpose to obtain practically half the forest areas of this country, characterizing this step as a venture in socialism and a menace to private ownership.

He commended the Georgia Forestry Association for the position it had taken against federal acquisition of commercial forests for commercial development, and

commended Governor Talmadge for his position in the matter.

While much had been said about the lumbermen's ruthless destruction of the forests, of cutting and abandoning, which he did not condone, it was no longer to be assumed that the lumberman is not aware of the necessity of so handling the forests as to perpetuate their own business; nor was it fair to assume that they are unwilling to cooperate to the fullest measure in conserving the forest resources. Many lumbermen, he said, have shown their willingness to promote conservation by introducing the best known forest practices.

He denied that private ownership of forests had failed; that if it had not succeeded as well as it might, it had not been more wasteful of natural resources than others; nor should the timberland owner be denied the federal aid that is so generously given to privately owned lands used for other purposes.

He pictured the sorry plight of the timberland owner with taxes to pay competing with the government growing timber on tax free land. The idea of citizens paying the government tax money to be used for setting up a business to compete with the taxpayer, he declared to be obviously unfair.

A country founded on freedom, of equal opportunity and individualism, he believed would not stand for government encroachment on these rights.

Address of Robert Fechner

"What the Civilian Conservation Corps is Doing in Forestry" was the subject of an address by Robert Fechner, Director of Emergency Conservation Work, Washington, D. C. He said that so many speakers had told of CCC work that there was not much left for him to say. While forestry was the principal interest and activity of the CCC, many other interests share in it and naturally try to get all they can, creating at times embarrassing difficulties.

He said he had just been in conference with a group desiring CCC labor to introduce carpet grass in the place of wire grass in south Georgia. Many thought at first that the main purpose was to plant trees, but it was concluded that it was proper to try to save what is left of our standing forests, not only to provide means for protection from fire, but to protect them from insects and diseases. He said, however, plans for planting on a very substantial scale were being made under state and federal ownership.

Referring to Mr. Moore's address, Mr. Fechner said that under at least some conditions it was an open question as to state and federal ownership of forest lands. An undeniable fact was that in the past the only interest of lumbermen was immediate profit in felling trees, passing on and leaving the mill community helpless, but he was glad to say that lumbermen generally had come to realize the harm their policy had done.

State and federal ownership, he said, afforded the greatest opportunities for forestry school graduates.

Preservation of watersheds, he said, was an obligation of the federal government. While the federal purchases in recent years has been greatly increased, President Roosevelt's interest is that of trying to be helpful. He was seeking to take over areas which are not a source of revenue to the owner in an effort to preserve the watersheds.

The attitude of the federal government, Mr. Fechner said, is to pay only a nominal price for land and that the average price paid for land was only \$2.70 per acre. At such a low figure, he insisted, the federal

government could hardly be claimed to be buying commercial forest lands, that in fact it was cut-over and abandoned land.

The need of recreational forest areas that only the federal government could go to the expense of providing, was cited as another reason for federal acquisition.

He said there were 1,468 CCC camps distributed among 45 states and the District of Columbia. Their work had proven so popular that President Roosevelt had authorized an increase in the camps and there were ten thousand desirable projects in hand. He believed the work would be continued for many years.

However, he said, that if Georgia and some other states did not put themselves in position to guarantee the maintenance of CCC work, they would not get the camps much longer. He stated he had made repeated requests upon the governors of these states without avail.

Timber Survey in South

A bright picture was painted by Capt. I. F. Eldredge, director of the southern timber survey of the U. S. Forest Service, as to the pulpwood supplies and naval stores future of the south, as he recounted the results of the timber survey thus far completed. He said the 85 field men had covered 90 million acres in the naval stores belt of the south in twelve months. Aside from the inventory of standing timber, 93 different volume tables had been prepared based on the measurement of 32,000 trees; made a survey of all naval stores stills; made many thousand measurements of trees to determine the effect of turpentine on the rate of tree growth; reported on wood working plants; consulted courthouse records as to land ownership and size of holdings.

Twelve forest survey releases have been made, five on naval stores, five on pulpwood, one on land use classification and erosion and one covering all phases of the timber situation. Six of these releases deal with Georgia.

Capt. Eldredge expressed the hope that sufficient funds would be allotted to complete the survey in the south during the next twelve months.

In the 30 million acres in four survey units in South Carolina, Georgia and north Florida, over 20 million acres, or nearly 68 per cent, are under forest cover, mainly slash and longleaf pine.

Of the 12,400 turpentine producers found in the survey, 9,400 were located in Georgia. Of the 1,118 stills, 632 were in the Georgia survey units. An interesting new development shown was that there were nearly 8,800 small producers in Georgia who do not have stills.

What the future holds for Georgia in naval stores production was presented on a chart and based on the number of round trees 3 inches and up in diameter. It was stated that it was evident that there is ample supply to meet all naval stores needs for years to come.

In making the survey of pine stumps suited to wood turpentine production, Capt. Eldredge reported the presence of 34 million tons of wood in the four units of South Carolina, Georgia and Florida.

As to pulpwood, the survey had revealed the presence of 137 million cords in the area surveyed, which by no means covers the pulpwood area of the south. In the two south Georgia units are 56 million cords.

In saw timber, it was reported that in Georgia, unit No. 1 (southeast Georgia) contains approximately 11 billion board feet of timber. No figures were given for unit No. 2.

Erosion Control With Relation to Forestry in Georgia

The original hills of Georgia were not red but grey, the transition being due to erosion, said Loy E. Rast, Director of Soil Erosion in Georgia, with headquarters at Athens.

Originally Georgia was heavily forested; no erosion was occurring; the streams were crystal clear; lands were fertile. Pioneers cleared fields and prospered. As soon as a field had ceased produced abundant crops, new fields were cleared, and so it continued till practically all of the land had been subjected to the plow. Later generations, not finding the land as profitable as their fathers, moved to the newly opened west to find other fields to conquer.

Erosion, he said, had taken from the hills of Georgia their organic matter and plant food to the stream channels. In this country as a whole more than 30,000,000 acres of once fertile land now lie idle, and as a result of the soil washing into stream beds, 40 million acres of fertile bottom land have been rendered useless. Approximately 125 million acres have been so depleted of fertility that people can hardly eke out a living from them.

Realizing, he said, that it is a crime against future generations to sit idly by and see the soil, our greatest natural resource, ruined by erosion, it was decided to do something about it. Erosion control projects to show farmers what can be done is the result.

Georgia, he said, has two such projects at present, one in Clarke, Madison and Jackson counties of 100,000 acres and one with headquarters at Americus with approximately 5,000 acres located in Sumter, Schley and Marion counties. As many as ten new camps are anticipated.

Speaking briefly of the methods employed, Mr. Rast told of terracing as a temporary means of control until more substantial means are established. Vegetative methods, he said, are nature's way. Grass will prevent erosion. Steeper slopes and badly eroded lands are planted to trees. Forestry, he said, is an integral part of farm management, a source of supplies for new industries, notably pulpwood for paper making. Staff members supervise the forests of the communities and supervise planting on badly eroded soils as an ideal means of erosion control. The average age of trees on the Athens area is 45 years, with an average of 136 pines per acres where the average should be 290, capable of yielding 3,500 board feet of lumber annually. Average hardwoods numbered 75 trees per acre where there should be 200.

Approximately one million seedlings had been planted to the most badly eroded lands in the Athens unit; black locust, pines, wild cherry, yellow poplar, aspen, beach and maple are being used. Shrubs are being employed in gullies. The planting program calls for 20 million seedlings, the purpose being erosion control, forest products, food and shelter for game and wild life and for aesthetic values.

Women's Clubs and Forestry

Mrs. T. H. McHatton, Athens, President of the Garden Clubs of Georgia, speaking on the subject, "How the Women's Organizations of Georgia Can Promote Forestry", said that women had been an enemy of the forests. They stood in the way of progress; out of them came wild beasts; open spaces gave security, but the forests have about gone and she sees fields being destroyed by the elements with the stability of destroyed forests itself being destroyed.

Preservation, protection and renewal of forests, she said, is getting to be one of wo-

man's ideas and she will stick to it until something is attained. The woman's movement to conserve wild beauty, she held, will be of untold advantage in protecting the forests. Galled and gullied hillsides can only be made attractive by planting trees. The desire for beauty and the production of wild flowers means every woman is an enemy of forest fires and a friend of economic forestry.

Reference was made to Garden Clubs' conservation week, of the influence of 4,000 women in promoting this object, the support given by public agencies, and the amount of interest created in forest protection.

Mrs. McHatton spoke of an undertaking to develop a Bartram society for the protection of wild flowers. If we expect to rehabilitate our forests, recover eroded lands and preserve God-given beauties, we must begin with the young, she said.

Highway beautification, she said, would involve forest protection and much could be done by the Highway Department. Contemplated arboreums over the state, she said, would be a help. In conclusion, she plead for co-operation with women in their conservation efforts.

Intercropping Corn and Pines

Marion Renfro, Quitman, a young farmer who conceived the idea of intercropping pines with corn, told of his results. He said he was reared in an atmosphere of the sawmill and turpentine industries, and had seen timberlands cut over, lying idle and not paying taxes, and he believed they could be used profitably growing a new crop of pines.

The idea came to him of growing corn and pines together, the corn to pay the cost of planting the pines and cultivation to promote their growth. Dr. Herty had encouraged him in the undertaking.

The land was prepared as for planting corn; seedlings were purchased from the tree nursery at Athens and were planted January 27, 1931, one acre being planted to slash pine and one acre to longleaf. Every other corn row was planted to pines. The usual cultivation for corn was given. Due to plowing and a drouth the longleaf were badly sanded and a poor stand resulted.

After the corn was "laid by", soy beans were planted a row between the pines. Only three rains fell between planting and harvesting the corn. A yield of 29.3 bushels of yellow corn was harvested. All costs of planting the pines, labor and taxes were charged, leaving a net profit of \$3.42 for the first year.

The average diameter of slash pine ten inches from the ground June 1932 was 1 inch; and on October 25, 1933 it was 2 1/4 inches. Longleaf had shown no increase except in foliage June 21, 1932, but October 25, 1933, they had attained an average of 3 1/2 inch in diameter.

The second year's sale of corn netted only 23 cents.

In January 1935, the slash pine averaged a height of 162 inches, some being 209 inches high. The diameters averaged 4 inches, some as much as 5 1/4 inches. Longleaf had gained an average of 8 feet in height, some 12 feet with average diameters of 2-2/3 inches, some 3 1/4 inches. An uncultivated acre had not shown half the growth of the cultivated acre.

In cooperation with Dr. Herty, plans were formed to sow carpet grass, centipede grass, also cowpeas, lespedeza and other legumes for pasture. Sowings have been made.

At the end of this year alternate trees

are to be removed for pulpwood to be used by Dr. Herty. Next year they will be thinned again down to 200 trees per acre. After that other plans will be formulated. He invited everyone present to visit his plots.

Resolutions Summarized

President Roosevelt was thanked for his interest in and active support of forestry, and a sincere desire expressed that he spend as much time as possible at his Georgia home, where he would find love and esteem of loyal Georgians.

Resolutions of regret at the absence of Bonnell Stone, founder of the association, with love and esteem further expressed by a decision to place a tablet at Vogel Park to commemorate his valuable contributions to forestry in Georgia, were adopted.

By resolution the association recorded its opposition to a transfer of the U. S. Forest Service from the Department of Agriculture to a Department of Conservation to be created by Senate Bill 2665.

Gratitude was expressed for CCC work in Georgia; approval of making it a permanent activity of the federal government and provisions for a larger amount of work on private lands was asked.

The work of Dr. Herty in converting pine pulp into white paper and pine cellulose into rayon was enthusiastically endorsed, and Georgians were called upon to support the promotion of important new industries based on these findings.

A resolution charging the Hon. Thomas Linder, Commissioner of Agriculture, with "infinite damage" resulting from his advice to farmers to burn the woods, and calling on him to print the resolution in the next Market Bulletin, was passed.

By resolution, the judges of the Superior Courts of the state were requested to appoint from grand juries committees to investigate and report on the violations of the forest fire laws, and that various counties use their county police to suppress fires.

The movement to obtain an appropriation from Congress to survey and mark the route of the DeSoto expedition was approved.

Officers Selected

The officers elected were as follows: President, T. G. Woolford, Atlanta; first vice president, W. T. Anderson, Macon; second vice president, Paul Chapman, Athens; third vice president, James Fowler, Soperton; secretary, Bonnell Stone, Oxford; treasurer, Joseph A. McCord, Atlanta.

Executive committee—Officers of the association and H. L. Kayton, Savannah; Alex K. Sessoms, Cogdell; J. M. Mallory, Savannah; R. E. Benedict, Brunswick; Thomas Hamilton, Augusta; E. George Butler, Savannah; Thomas Candler, Blairsville; Dr. W. G. Lee, Macon; C. A. Whittle, Atlanta; Judge Ogden Persons, Forsyth; Jim L. Gillis, Soperton; G. D. Marckworth, Athens; J. S. Green, Butler; Mrs. T. H. McHatton, Athens; Elliott Reed, Savannah; Mrs. Chas. Center, College Park; J. F. Jackson, Savannah; W. M. Oettmeier, Fargo; J. Henry Gaskins, Nashville; J. C. Kimbrough, Chipley; and the following chairmen of committees: E. S. Center, Jr., Atlanta; Mrs. M. E. Judd, Dalton; Roland Turner, Atlanta; W. H. Barnwell, Atlanta; Jack Williams, Waycross; B. M. Lufburrow, Atlanta; J. L. Rountree, Summitt; Dr. Chas. H. Herty, Savannah; Miss Emily Woodward, Vienna.

PULPWOOD SOUTHWEST GA. 22 COUNTIES SURVEYED

Seventeen Million Cords Available on Three Million Acres of Forest Land According to U. S. Forest Service Survey.

According to a preliminary report of the United States Forest Service Survey, there are approximately 17 million cords of pulpwood available in twenty-two counties of southwest Georgia. The counties embraced in the survey unit are Deely, Wilcox, Crisp, Ben Hill, Worth, Turner, Irwin, Tift, Berrien, Cook, Colquitt, Lanier, Lowndes, Brooks, Thomas, Grady, Mitchell, Baker, Decatur, Seminole, Miller and Early. A report has already been made on the counties of southeast Georgia.

The surveyed area of southwest Georgia covers nearly 5,586,000 acres, of which approximately 54 per cent, or 3,020,400 acres is forest land.

Nearly 70 per cent of the forest area is in second growth stands, 88 per cent of which is of pulpwood species with an estimated yield of 17,000,000 cords.

Half of this is composed of turpentine timber, potential, working or idle. After turpentinizing, the trees are suitable for pulping.

Classified further, the report shows 4,545,000 cords of round turpentine species of pines, 3,386,000 cords of working and idle turpentine pines, 1,415,000 cords of worked out turpentine pines, 3,961,000 cords of non-turpentine pines. Pulping hardwoods such as gum, maple, bay, magnolia, etc., will produce 3,333,000 cords.

In addition to the pulping woods, there are 2,248,000 cords of non-pulping woods, making a total of 18,888,000 cords for the area.

Forestry Lost a Valued Supporter in Major Cohen

In the death of Major John S. Cohen, May 13, the cause of forestry lost a highly valued supporter. No paper in the state has given so liberally of its editorial space to persistent and capable advocacy of forestry as the Atlanta Journal of which he was the head.

Dr. Gerry Visits South

A recent, but in the past few years too infrequent, visitor in the south was Dr. Eloise Gerry, of the U. S. Forest Products Laboratory, Madison, Wisconsin. Her studies on how cells of southern pines elaborate gum, and her preparation of the recent Handbook on Naval Stores Production are contributions of great value to a southern industry.

Mr. T. G. Woolford, Atlanta, president of the Georgia Forestry Association and member of the Commission of Forestry and Geological Development of Georgia, was recently re-elected vice president of the United States Chamber of Commerce.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

TABLEWARE MANUFACTURE IN THE SOUTH

A. V. HENRY

Department of Ceramic Engineering
Georgia School of Technology

Not so many generations ago so-called china tableware or dinnerware was reserved almost entirely for the wealthy. Now when serviceable ware is available at a cost within the reach of everyone, I wonder if we appreciate how much thought, how much effort and money have been expended to make this possible.

Most of the tableware manufactured in this country is technically known as hard earthenware, although some factories spe-

cialize in the more costly true china and porcelain, the difference being largely one of structure developed by varying heat treatments.

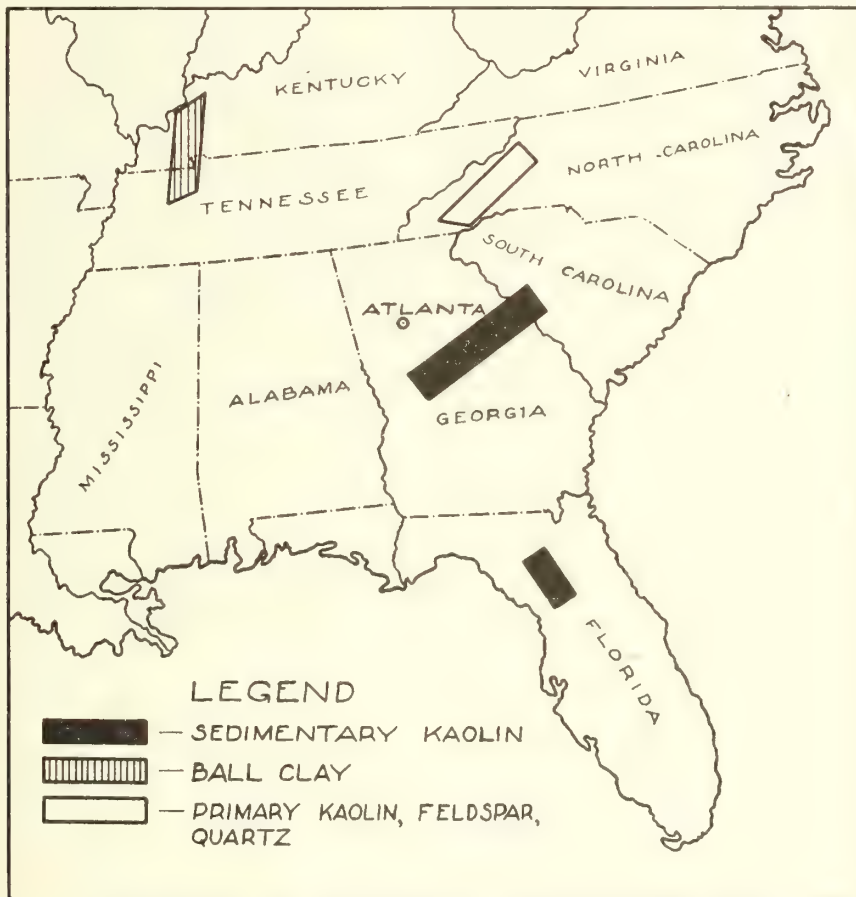
Tableware is made from a mixture of two or more clays, pulverized feldspar and pot- ters flint, a name given to pulverized quartz rock or sand. These raw materials are gathered from many areas and even as far as Europe and other foreign countries. After being assembled the materials are carefully proportioned and then mechanically blended with water until the resultant slip has the consistency of thick cream. This slip is passed through fine screens and over electromagnets which take out any coarse or foreign matter and any iron that might be present. It now passes to a cistern-like storage equipped with agitators to prevent settling and separation of the body constituents. The slip is then pumped into filter presses where enough of the water is removed to give the mass its maximum plastic condition. After being thor-

oughly kneaded in a pug mill the plastic mass is finally ready to be formed into dishes. For many years cups, saucers, dinner plates and the like were made essentially by hand and only most recently have machines been developed to mechanically form these wares. Nevertheless, hand methods are still used in most factories. Here the helper takes the proper amount of the plastic raw material and bats it into a griddle cake-like disc. This is then thrown over a plaster mold, the surface of which represents for example a dinner plate. The mold is placed in a jigger, a machine that revolves in a horizontal plane. The operator then pulls down a template having an edge corresponding to the contour of the bottom of the plate. The excess material is thus scraped off giving the plate its final shape. The tableware is dressed, dried and fired to approximately 2200 degrees Fahrenheit, after which it is ready to be glazed. The glaze, too, is prepared in the slip form, of minerals somewhat higher in flux value than the body mix. It is applied by dipping and then given its vitreous condition by a second firing. If the ware is to be decorated a third firing is necessary.

While at this time there are no dinnerware factories in Georgia, the future is promising as all conditions are favorable. The market here in the South now approximates \$15,000,000 annually, is growing. As we become more industrialized, and as our purchasing power increases and standards of living improve, the market for tableware will grow proportionately. Southern demand now is being supplied largely from the North with the one exception, a factory in Tennessee. This market surely should be entirely satisfied by southern industries. In addition, it can be shown that costs of other factors involved in tableware manufacture are sufficiently favorable to the South to permit successful competition in the North. Let us examine briefly some of these factors. Labor is a large item. Despite recent advances, there is still a labor saving in the South approximating 30 per cent. In this connection it should be noted that, in general, increases in wage scales are desirable in that they increase purchasing power and permit a betterment of living standards. Fuel, also, is a large item in tableware production. Many sections of Georgia are adequately supplied with natural gas piped from the extensive Louisiana fields. In this industry natural gas constitutes an ideal fuel, and, considering that it is now available to the South at a cost of approximately one-half of what it is in certain of the more important producing centers of the North, the advantage can readily be appreciated.

With regard to raw materials, Georgia is equally well situated. While it is true that in no locality do we find all of the materials necessary for tableware manufacture, Georgia is centered in an area producing essential clays and minerals as can be seen on the accompanying map.

The state itself is a large producer of one of the clays used, namely, sedimentary kaolin. Our production now is somewhat greater than two-thirds of all that is mined in the country. A large portion of it, how-



LOCATION OF ESSENTIAL MATERIALS FOR CERAMIC WHITEWARE INDUSTRIES

cialize in the more costly true china and porcelain, the difference being largely one of structure developed by varying heat treatments.

Tableware is made from a mixture of two or more clays, pulverized feldspar and pot- ters flint, a name given to pulverized quartz

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ever, is now being used by the paper industry either as a filler or coating medium.

It might be asked why, in view of these advantages, are there not more dinnerware plants in the South. The answer is quite similar for this industry as for many others, namely, northern factories are now capable of easily satisfying the country's demands, and there is little incentive on the part of present owners to bear the cost of dismantling and rebuilding in the South. Too, the southern market is available to these manufacturers because of lack of competition, and the net result is merely an additional cost being charged our consumers because of extra distribution expense.

With the readjustment of industries being induced by conditions of the present time it seems probable that the tableware industry will become more and more decentralized, and the advantages of the South will be recognized.

FROM A GEOLOGIST'S NOTEBOOK

Members of the Georgia Mineral Society enjoyed a splendid trip to Asheville, N. C., on the week-end of April 27th. A group of seven Georgians met with the Southern Appalachian Mineral Society at the Biltmore Forest home of Mr. Burnham S. Colburn. Mr. Colburn's private museum of Southern minerals and gem stones is said to be the finest in the world.

Dr. C. F. Park, Jr., of the U. S. Geological Survey is continuing his direction of the investigation of the gold resources of Georgia. Dr. Park plans to return to Washington, D. C., around June 1st but expects to leave a party in the field to visit and examine all properties known to have yielded gold.

An exhibit of the common rocks and minerals of Georgia at the Macon convention of the Georgia Forestry Association aroused much favorable comment. The exhibit of kyanite and vermiculite, Georgia's newest commercial minerals, received especially favorable attention. A number of copies of the latest bulletin of the state geological survey, Bulletin 46, "The Kyanite and Vermiculite Deposits of Georgia" by Louis M. Prindle and others, were distributed.

A list of the small wayside potteries and clayworkers is being compiled by the State Geologist, R. W. Smith, who desires to be of all possible aid to these developers of a part of Georgia's great mineral wealth. Any information as to the location, ownership, and operation of these potteries will be gladly received by Mr. Smith.

Students of Georgia geology will be interested in a recent publication of the

United States Geological Survey (Prof. Paper 179) on the Origin of the Copper Deposits of the Ducktown Type in the Southern Appalachian Region, by C. S. Ross. Not only do the famous copper deposits of Ducktown, Tenn., extend over the state line into Georgia, but the author, through his study of this type of deposit has come to conclusions in regard to their origin that may have considerable bearing on the origin of Georgia's gold deposits. The report may be obtained for \$.45 in coin or money order (not stamps) from the Supt. of Documents, Washington, D. C.

R. W. Smith, G. W. Crickmay, and Lane Mitchell of the State Geological Survey recently accompanied a field party of Johns-Hopkins University geology students on a survey of the Cartersville area. Ocher, Barite, and manganese mines were visited. Professor J. T. Singewald, Jr., was in charge of the field party. Mr. T. B. Holmes of the White Manganese Corporation kindly had the party taken under ground in the William Lee shaft to view the mining operations for the manganese ore.

Beginning with the April number, the paper used in printing the National Geographic Magazine is coated with Georgia clay. The National Geographic Magazine uses numerous black and white and colored illustrations which require the highest type of magazine paper for adequate reproduction. The use of Georgia kaolin as a coating clay for this paper is testimony to the high quality of clay now being produced in Georgia.

KYANITE DEPOSITS PROMISE NEW INDUSTRY IN GEORGIA

The development of a new mineral industry in Georgia is foreseen by Richard W. Smith, State Geologist, who states that kyanite deposits of the State are evoking widespread interest in the ceramic industry of the nation. Mr. Smith announced the recent release of Bulletin 46 of the State Geological Survey, "The Kyanite and Vermiculite Deposits of Georgia". Kyanite, which is used in manufacture of high grade refractories and fire-brick, has been discovered over wide areas of the State. The survey was made during the summer of 1934 by the U. S. Geological Survey in cooperation with the Georgia Division of Geology. The record of all properties visited for this investigation and for previous examination is included in the new bulletin. Mr. Smith stated that he had received numerous requests for the bulletins from ceramic manufacturers.

The kyanite is found in the Piedmont and mountain areas of north and central Georgia. The only areas producing at the present time are in Habersham county in northeast Georgia and these properties are a part of a U-shaped belt extending over into Rabun county and having a length of about 30 miles and a width of 1000 feet or

more. The average kyanite of the schists has a small percentage of silica, but some placer deposits yield a product almost free of impurities. The Bureau of Mines is conducting experiments concerning the utilization of the schist material and predicts that this can be recovered and used when there is sufficient demand.

The vermiculite resources of Georgia have been only partly examined. The most promising deposits are in Towns county, near the North Carolina line. This golden colored mica is useful in the manufacture of insulating material and as a pigment in inks.

The bulletin is sent free to interested parties on receipt of postage by the State Geologist, 425 State Capitol, Atlanta, Georgia. The shipping weight is two pounds.

April Publications of the U. S. Bureau of Mines of Interest to Georgia Mineral Producers

Information Circular 6822, Mica, by F. W. Horton. 56pp. 10 figs. Covers salient features of occurrence and mining of sheet mica in the U. S. and preparation for market: discusses properties of micas and outlook for domestic industry.

Mineral Market Reports

MMS 350. Gold mining and production in the United States in 1934, advance summary. 3pp.

MMS 356. Value of the mineral products of the U. S., 1931-1933, by states—summary 1 p.

MMS 357. Aluminum salts industry in 1934—advance summary. 2pp.

MMS 361. The bauxite industry in 1934—advance summary. 2pp.

These may be obtained free of charge on application to Information Division, U. S. Bureau of Mines, Washington, D. C.

The regional office of the U. S. Forest Service, located at Atlanta, had 75 employees July 1, 1934, when it was established. It has grown to 115 and will probably grow to further size.

Twenty Million Acres of Georgia Can Grow Pulpwood

In answer to a press inquiry as to how much land in Georgia can produce pulpwood for making paper, State Forester B. M. Lufburrow, of Georgia replied that there are twenty million acres in Georgia out of its 27,000,000 of forest and potential forest land suitable to growing pulpwood, an area he states, capable of producing the entire newsprint needs of the country.

Vocational Forestry in Georgia Treated in Magazine Article

The May issue of American Forests carried an article entitled "Forest Scholars" written by C. N. Elliott, district forester at Augusta. This well written article deals with vocational forestry conducted jointly by the Georgia Forest Service and the Division of Vocational Education of the State Department of Education.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

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No. 7

TRIBUTES TO A FALLEN LEADER, BONNELL STONE

**FATHER OF FORESTRY IN GEORGIA, EARNEST PROMOTER,
LOVABLE CHARACTER**

**In His Death the State Loses a Builder of Forest Wealth, a Founder of
Parks, a Legislator of Vision and Zeal, a Friendly Man, Lover of Out-
doors, a Sympathetic, Considerate Confrere, Public Spirited, Socially
Minded, a Worthy Citizen with a worthy Record.**

Bonnell Stone, age 48, died May 25, 1935, at his home, Oxford, Georgia.

In his death, the cause of forestry in Georgia lost its pioneer and most enthusiastic leader. To him credit is due for inaugurating and promoting many important achievements of forestry in this state.

This edition of the Forestry-Geological Review is devoted largely to tributes paid this great leader by intimate friends in forestry work.

A brief sketch of the life of Mr. Stone is given herewith as an introduction to these tributes.

Bonnell Harold Stone was born December 3, 1887, at Oxford, Georgia. He was the son of Harry Harlan and Susie Bonnell Stone. On both his father's and mother's side were distinguished educators and ministers.

Mr. Stone received his school training at the Palmer-Stone school, completing his high school studies in 1902. He entered Emory University at Oxford, completing his studies in 1908, and then took a course in forestry at the University of Georgia. In 1911-12 he was a forest examiner employed by the United States Forest Service.

In 1913 Mr. Stone became forester of the Pfister and Vogel Land Company with headquarters at Blairsville, in which capacity he served until 1932, when he entered the service of the state as general development agent of the newly formed Department of Forestry and Geological Development.

He was a representative from Union County in the General Assembly of Georgia 1925-26, in which he was instrumental in having an act passed creating the Georgia Forest Service. He was a former president of the Southern Forestry Conference; the founder of the Georgia Forestry Association, in which he served as president, secretary and chairman of the executive com-



**Bonnell Stone, Forestry Leader,
Died May 25, 1935.**

mittee; was a member of the Appalachian Forest Research Council and on the executive committee of the Georgia Forest Service.

In his active social life, Mr. Stone was a member of the Independent Order of Hoo Hoo; Woodmen of the World; I. O. O. F.; Kappa Alpha fraternity; A. A. O. N. M. S.; and a member of the Methodist Episcopal Church, South.

He was married to Edna Ausland to whom three children were born, Edna Mildred, Bonnell Harold, Jr., and Edward Morton.

Action of Executive Committee Georgia Forestry Association

Death removed from our organization on May 25, 1935, Secretary Bonnell Stone.

Mr. Stone was a pioneer leader in the cause of forestry. He earnestly labored in season and out, whole heartedly and persistently, that the forests of Georgia might be protected and restored to their full wealth producing power.

He fellowshipped with the great outdoors and found inspiration therefrom, but he loved his fellowmen none the less. Indeed, he delighted in friendliness, and was blessed with a cheerful and radiant spirit that engendered cordial friendships.

Mr. Stone was a crusader, consumed with great desires, actuated by visions of great things to be; undaunted by adversities, upheld by a faith to believe that somehow a way would be found; persistent, self-sacrificing, diligent—he left a record of many creditable achievements.

To Mr. Stone belongs the honor of founding this organization, and a large share of credit for the success it has achieved, such as the creation of the Georgia Forest Service, appropriations for its support, and legislation that helped finance the Pulp and Paper Laboratory at Savannah.

To Mr. Stone the State of Georgia owes the inauguration of a state park system. It was through his personal influence that the gift of Vogel Park on the Blue Ridge mountain was obtained. He also contributed his time and influence in creating other state parks, among his last activities being the preparation of literature that sought to popularize these recreational centers.

This association has cause for gratification in that at its annual meeting on May 17 and 18 at Macon, steps were taken to place a tablet at Vogel Park to memorialize Mr. Stone's services to forestry, an act which pleased Mr. Stone very much, and doubtless cheered his last days.

BE IT RESOLVED: That the executive committee of the Georgia Forestry Association, in session, conveys its sincere sympathy to the members of his family in their great bereavement; and

BE IT RESOLVED: That the executive committee of the Georgia Forestry Association expresses its sense of a very great and grievous loss in his death; and

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H. D. Story, Jr., District Forester...Albany
W. G. Wallace, District Forester...Columbus
Mrs. N. N. Edwards, Secretary...Atlanta
Mrs. R. S. Thompson, Treasurer...Atlanta

Geological Division

R. W. Smith, State Geologist...Atlanta
G. W. Crickmay, Asst. State Geologist,
Atlanta
Lane Mitchell, Asst. State Geol...Atlanta
Miss Margaret Gann, Clerk...Atlanta

BE IT RESOLVED: That copies of this resolution be sent to Mrs. Bonnell Stone, recorded in the Minutes of this association, and sent to the press.

Indian Springs, June 21, 1935.

Tribute of T. G. Woolford, Pres. Ga. Forestry Association

It is impossible for me to think of forestry without Bonnell Stone immediately coming to mind. I had heard many people talk about various phases of forestry such as timber, naval stores and lumber, but Bonnell was the first one to talk, to me, about the forests themselves and their possibilities of untold wealth. He was thinking in forest terms much ahead of the times. His ideas fascinated me.

As the years came and went I learned to know him better and to love and appreciate him more. I have seen many of his ideas bear fruit, and have marveled at his foresight and wisdom in discerning the future of forestry in Georgia so clearly and definitely.

His interest in forestry must have been born with him because he enrolled as a student in the first forestry school at Athens, and the love of the trees, the outdoors, and forestry development were always with him. A more unselfish man in public service I have never known. His enthusiasm, knowledge, and vision served as an inspiration, and his memory and his work will ever be with us.

The "Father of Forestry" in Georgia has left us, and the greatest inspiration to me is the thought of trying to carry forward the work and ideals which he so nobly advanced.

T. G. WOOLFORD, Atlanta.

Devoted to Forestry

Bonnell Stones' distinguished quality as a Forester was his passionate devotion to all of its interests. His faith in its ultimate successful development as one of the State's most valuable resources never failed him. He also believed that the Georgia Forestry Association has done and is now doing the work that is necessary for the true advancement of Forestry.

Those who are now doing the work which he laid down can draw freely of his unlimited faith for the courage that is necessary to make the people of Georgia fully conscious to the importance of the economic value of our forest areas.

In addition to our admiration of his faith in his profession, we who worked and associated with him loved and appreciated him for his good life and enduring friendship.

OGDEN PERSONS, Forsyth.

A Fallen Leader

Bonnell Stone was truly the "Father of Forestry in Georgia," the father of ideas that materialized in the Georgia Forestry Association, the Georgia Forest Service, Vogel Park and in numerous other substantial accomplishments. His attitude was one of fatherly concern about every forestry movement. He thought constantly about how to promote forestry in Georgia, talked forestry, lived forestry, died while performing service to forestry. No more shining example of a sincere whole hearted and persistent devotion to a cause is to be found than that revealed by Bonnell Stone's service to forestry.

It was my privilege to be intimately associated with Mr. Stone for many years. We had many common problems to solve and labored together in close sympathy and understanding. He loved to analyze every situation thoroughly, view it from every angle and reach conclusions deliberately.

He was friendliness personified, and those who knew him intimately were not only charmed by his personality, but found him a sympathetic and staunch friend. His personal qualities fitted him well for public relations, so much so that legislation affecting forestry in Georgia has been largely due to his activities.

The intensity of his devotion led him to long hours of labor, to forgetfulness of the conservation of his own health and to the shortening of his life. His fatherhood of forestry in Georgia has, therefore, been hallowed by self sacrifice.

A towering tree in Georgia has fallen, leaving a strange void on the horizon. One never fully realizes the space a tree has occupied until it has fallen.—B. M. Lufburrow, State Forester.

Indefatigable Worker

My first acquaintance with Hon. Bonnell H. Stone was in 1921. At that time I was a member of the senate, and had introduced a bill that would prohibit the cupping of timber under ten inches in diameter. Of course, he being interested in forestry, caught this and he and Mr. Peters, of the United States Department, looked me up.

We became associated in the work together and ever since we have been closely connected with each other, and I consider his acquaintance one of the brightest memories in my life. He was an indefatigable worker for the cause of forestry, but we cannot say tireless; because often after long hours of persuasion on members of the legislature to support the present forestry set-up, he would retire to his room, where he would spend restful time recuperating from his hard work.

He had many notable attributes of character, but the greatest, in my estimation was his fidelity to his work and his friends. He literally devoted his entire life to the work and cause of forestry, which was the nearest and dearest to his heart, and he died in harness.

Space here will not permit an enlargement on his work, but others can pay tribute to it where space will permit. It was a pleasure to have known him; to have served with him; and, to have been numbered with his intimate friends. His life work can be used as an example to the young folk; to achieve success one needs a sole purpose in life and an objective to work to, and be able to reach that objective.

J. LEONARD ROUNTREE, Sumter.

Forestry's Great Loss

In the death of Bonnell H. Stone, forestry has sustained a great loss. Because he was one of the first to catch a revelation of the opportunities, possibilities and potentialities of forestry he has often been referred to as the "Father of Forestry in Georgia." He was a born forester and took a post graduate course at the School of Forestry at the State College of Agriculture. He was a pioneer in developing agencies for the promotion of forestry in privately owned lands, also in State and National forests, and held many important offices in connection with this work, proving that he had the support and confidence of his co-workers in all of his undertakings.

While Bonnell Stone gained his wide acquaintance through his work in forestry, he gained the love and affection of all those who knew him and worked with him for his sweet spirit and sympathetic understanding.

Of all who have builded well for his State and County and with unfailing zeal, none will be more affectionately remembered than Bonnell Stone.

Of ostentation, show and self-glory he had not a tinge. Generosity, sincerity and simplicity marked his every act.

A golden comrade he was. He worked earnestly, faithfully and ardently, and his work lives after him in the hearts that ache at his going.

"But now he sleeps where the daisies nod,
And the clover hangs its head,

Where the wild birds come and the wild
bees hum,

Above his lonely bed.

He fought the fight, he kept the faith,

His fame shines bright and clear,

His memory lives in all our hearts,

Which will hold it ever dear."

JACK WILLIAMS, Waycross.

An Interesting Citizen

In the death of Bonnell Stone the state has lost one of the most beloved enterprising citizens.

It was my pleasure to know him for the last twenty years and his whole life was devoted to making our great state and citizens better in every respect.

I had the pleasure of serving four years with him in the Georgia Assembly, and every act of his was to better our living conditions. His untiring efforts and his loyalty to every cause was unsurpassed.

I extend to his family and to his friends my deepest sympathy.

HENRY C. KIMBROUGH, Chipley.

His Work Lives After Him

When the history of the forestry movement in Georgia is written one of those names that will head the list of pioneers in the great work of forest preservation and restoration will be that of Bonnell Stone, of Oxford, Georgia.

Bonnell Stone, whose death some weeks ago saddened every member of the Georgia Forestry Association and many hundreds of friends throughout the state, literally gave his life for the cause. Through the years he was the greatest inspiration the Forestry Association had and it was largely due to the efforts of the Association that the State of Georgia began to recognize forestry as one of the most important assets of the state. Annual appropriations from the State Legislature for the past several years together with co-operation from the Federal Government have made possible the great work that has been accomplished.

We may attribute to Bonnell Stone much credit for the fact that timber is now said to be growing more rapidly in Georgia than it is being cut. This means that the wholesale slaughter of timber areas has been stopped and intelligent reforestation methods adopted. We are proud of the fact that forestry products in our state rank next to cotton as Georgia's most valuable crop.

Bonnell Stone is dead, but his work lives

after him. His body was frail and physical suffering was his lot practically all his life. In spite of the pain that racked his frail frame there was that spark of determination in his eye and an indomitable spirit in his soul.

It is a privilege for me as a member of the executive committee of the Georgia Forestry Association to pay Bonnell Stone tribute at this time.

THOMAS HAMILTON, Augusta.

Lived To See His Good Works Bear Fruit

Bonnell Stone was a pioneer in the wilderness of human destruction, as applied to our trees. So far as I can recall, he was the first individual ever to tell me the value of trees and what they might do for Georgia, if they were properly appreciated.

He was the most indefatigable worker that I have ever seen, devoting his time to a cause whether paid or not.

We shall greatly miss him from the service. He brought the forestry-minded people of Georgia to the place where it was difficult to look at a tree without thinking of Bonnell Stone.

The particularly gratifying feature about his death, if there can be a gratifying feature about the death of one who served so well and who still had so much of life before him, is that he lived to see tangible results from his efforts, saw Georgia made forestry-minded, saw the great fight against fires and ruthless destruction of trees. He saw his state grow in appraising the woods as an asset, not only from the standpoint of timber and shade and fertilization, but from the standpoint of conserving the streams and farm lands.

Where most men have to be satisfied with doing a good deed and leaving it to others to cultivate and gather the crop, Bonnell Stone lived to see his good work bear fruit in the fine and loyal mind of Charles Herty. It is probable if there had been no Bonnell Stone, there could have been no Charles Herty in Georgia.

W. T. ANDERSON, Macon.

Accomplishments of a Pioneer

I first met Bonnell Stone in Macon in 1922, where he had taken the initiative in calling together a group of land owners, lumbermen and naval stores people for the purpose of organizing a Georgia forestry association. So far as I know, it was the first attempt to co-ordinate those interested in our forest product industries into a compact group for mutual co-operation. Bonnell Stone was a dynamo of activity at this conference and at all others where I subsequently met him. Being a practical forester himself, he readily convinced others of the soundness of his suggestions and the feasibility of his

plans. He was both an executive and a worker; his brain seethed with ideas and to him largely is due the credit for the progress which forestry has made in Georgia. Difficulties were never insurmountable to Bonnell Stone, his accomplishments were those of the pioneer and it was indeed a privilege to have known him and worked with him.

H. L. KAYTON, Savannah.

A Zealous Forestry Leader

It was my good fortune to be closely associated with Bonnell Stone for several years. He was so wrapped up in forestry that it was his constant topic of conversation. How to do more for the cause of forestry in Georgia actuated his thinking and planning. But at all times he was willing to courteously listen to others who had ideas to suggest—in fact he was adept at stimulating interest and constructive thinking on the part of others.

While courteous consideration was a pleasing characteristic of Mr. Stone, and while he was always open minded and willing to modify his views, his great achievements were obtained through promoting full and frank discussions in which he contributed mainly by diplomatic reconciliations with unostentatious guidance toward unity of purpose and action.

He was far seeing and guarded in his policies, but he never confronted a situation, no matter how difficult, which he did not believe could be successfully handled. When others would have given up, Bonnell was persistent and resourceful. In matters of legislation, he was a power.

Mr. Stone was indeed the "Father of Forestry" in Georgia, and as a good father, he gave his best with zeal, devotion and energy that doubtless shortened the years of his life.—C. A. Whittle, Editor.

State's Loss of a Devoted Son

The state has lost an intelligent, far-sighted and devoted son, the "daddy of forestry in Georgia". He will also be missed by a host of friends who loved him for his loyalty, cordiality and charming personality.—J. M. MALLORY, Savannah.

Naval Stores Control Committee Election Held

Announcement of the results of an election of a new naval stores control committee was made in June. Those elected are as follows: Georgia—C. L. McCarthy, White Oak; George W. Varn, Valdosta; J. Leonard Rountree, Summitt. Florida—A. F. Bullard, DeFuniak Springs; R. L. Black, Gainesville; C. P. Kelly, Madison. Alabama—C. M. Stallworth, Mobile. Mississippi—R. M. Newton, Louisiana. Texas. North and South Carolina—W. L. Rhodes, Estill, S. C.

RESOLUTION COMMERCIAL SECRETARIES

This Association has learned with deep regret the untimely death of Mr. Bonnell Stone, Secretary of the Georgia Forestry Association for many years, and one of the prime movers in its organization.

Mr. Stone was familiarly known as the father of forestry in Georgia, and perhaps through his effort more than anyone else is due the progress that has been made in forestry.

Mr. Stone was well known to the members of this Association and, aside from his profession, was greatly loved for his high type of citizenship.

We mourn his death and extend to Mrs. Stone and other members of the family our sincere condolence.

The Secretary is instructed to send a copy of this resolution to Mrs. Stone, and spread it upon the minutes of the Association.

Adopted unanimously.

A Leader in Georgia Forestry

As a founder of the Georgia Forestry Association and as its secretary until the time of his death, Bonnell H. Stone rendered valuable services to the conservation and development of the State's woodland resources. A trained forester himself, he saw not only the need of protecting such resources from fire and disease and destructive insects, but also their large and vital relationship to the commonwealth's agricultural and industrial future. This he saw long ago with the vision of a pioneer in a cause that struggled for recognition and support against public apathy as well as private indifference. Today every alert land owner and every informed business man knows something of the importance of safeguarding and replenishing our timber crops; but when the Forestry Association began its educational work, the all too prevalent idea was speedy profits regardless of future interests.

All who labored during those uncertain and often discouraging years to build up a popular sense of the permanent values in woodlands merit the people's gratitude, for without such efforts the great opportunities now opening in Georgia's wood-pulp industries and in other fields of forestry enterprise would have been sorely impaired, if not lost. Among these leaders Bonnell H. Stone was ever faithful. Through his initiative and influence was secured the gift of the State's first forest park, from the Vogel lands at Neel Gap. Truly, his works live after him.—Atlanta Journal, May 29, 35.

Bonnell Stone

Georgians who appreciate the importance of the state's vast forestry resources should

ever feel grateful to Bonnell Stone, much of whose life was devoted to study of means of protecting and developing timber lands. His death at Oxford, Ga., Saturday, saddens all who knew him. In his capacity as secretary of the Georgia Forestry Association, of which he was one of the founders, he had visited Savannah on numerous occasions and had built up strong friendships here, especially among those interested in forestry work. Only a short time before his death the association, for which he had performed such unstinted service, decided to erect a tablet to his honor in Vogel Park at Neel Gap as a mark of appreciation of his work. He had been largely instrumental in the establishment of this park, as well as the Neel Gap highway.

Mr. Stone was a graduate of Emory College and the knowledge of forestry which he later acquired at the University of Georgia was supplemented by practical experience in the timber regions. He served as mayor of his native city and also as a member of the State Legislature. Not only for his untiring efforts toward the preservation and upbuilding of the state's resources, but for his numerous other humanitarian instincts will his memory be cherished by his fellow citizens.—Savannah News.

SAVANNAH LANDS PAPER MILL—FRUITS OF PAPER LABORATORY

The generosity of the City of Savannah in providing a building, water, electricity, etc., for the Pulp and Paper Laboratory, directed by Dr. Chas. H. Herty, has been rewarded by a contract to erect a 4-million dollar paper mill by the Union Bag & Paper Company.

The mill is being constructed on a water front, signifying that the company is to take advantage of water as well as rail hauls to large consuming centers.

Pines of the southeastern part of the state are to provide a perpetual supply of pulpwood for this mill. Watch the paper mills move to the south, where there is an easily accessible and abundant supply of raw materials, and where pulpwood is grown faster than anywhere else in the nation.

RAYON FROM TUPELO GUM RECENT HERTY DISCOVERY

The tupelo gum of South Georgia can be used for making rayon, according to recent discoveries made by Dr. Raush and Dr. Herty at the Savannah Pulp and Paper Laboratory. It is thought that the black gum will work as successfully.

Gum fibres are not as long as those of the pines, and while not adapted to making good newsprint, Dr. Herty states it is suited to making book paper.

McCRARY SUCCEEDS ELLIOTT DISTRICT FORESTER, AUGUSTA

On June 1, Charles Newton Elliott, who has been district forester with headquarters at Augusta, resigned to become regional forester for the U. S. Park Service. He is attached to the regional office, having headquarters in Atlanta, of which J. H. Gadsby is director. His duties will relate to forestry phases of parks which the federal government is helping to construct.

The withdrawal of Mr. Elliott from state forestry service removes a valuable forester, who has numerous friends and well wishers. For the present he is still residing at Augusta.

Stewart L. McCrary, chosen to succeed Mr. Elliott, comes to the Augusta district from Hinesville, where he has made an excellent record as forester of the CCC camp at that place. He is a native of Royston and was a forestry student of the State College of Agriculture at Athens.

Previous to accepting his position with the CCC camp at Hinesville, Mr. McCrary had been with large lumber companies in Oregon and Washington; also with the U. S. Forest Service on the Natural Bridge National Forest in Virginia and the Nantahala National Forest in Georgia and North Carolina. His training and experience fit him for excellent service as a district forester.

FORESTRY FORCE PICNICS AT STEPHENS MEMORIAL PARK

Saturday, June 15, the forestry force in the Capitol dropped everything at 10 o'clock and hied to Alexander H. Stephens Memorial Park at Crawfordville, to find ravenous appetites confronted with heaps of fried chicken and all the garnishings of a real feast. Supervisor C. B. Ellington was the bounteous host.

Then came swimming, an exciting baseball game of mixed teams, a barbecue and dancing. That baseball game, umpired with an even handed justice by State Forester Lufburrow, culminated in claims of victory by both sides, and also in sore muscles that on the Monday following were still exciting moans. The stars of the game were so numerous, fast and brilliant they could not be identified.

Wants Position of "Deforester"

Many applications for various jobs come to State Forester B. M. Lufburrow. One on file is for position of "deforester."

Of course, *reforestation* is one of the chief objectives of the state forest service and not *deforestation*. Woods burners are the chief deforesters and only reforesters receive encouragement in this state.

"Are you familiar with mules?" asked a farmer of a colored man.

"No, sah; ah knows too much about den to be familiar wid 'em."

FIRST DISTRICT

**Russell Franklin, Dist. Forester
Rome**

T. P. O. ITEMS

A timber protective Organization has recently been organized in Cherokee County. Some 59,000 acres have been signed up to date and more is expected within the near future. It is planned to consolidate the TPO's in Cherokee, Pickens, Gilmer and Dawson Counties and have one large protective system with the tower and telephone system planned for the entire area rather than for the individual TPO. The County Commissioners are co-operating with each of the above TPO's by contributing a certain amount each year toward fire protection.

The Lookout Mountain TPO has recently installed twenty-five miles of telephone line with the help of FERA labor. They have needed some connection between patrolmen and the various landowners for some time. They now expect to have at least one patrolman on every fire within a short time after the fire breaks out. This spring has seen a great reduction in the number of fires occurring in and around the protected area, and the local citizens point with pride to the fact that the TPO is largely responsible for reducing the number and size of fires in that section. This TPO has been responsible for a great amount of educational work in Walker, Dade and Chattooga Counties. Each of the patrolmen is required to contact every school in his patrol area, and to enlist the students' help in suppressing all fires in the vicinity of the school.

GENERAL:

Anyone having any experience with Johnson grass suppressing seedlings that were set out this spring, please get in touch with me and tell me if this grass will kill the seedlings if allowed to go through the summer without weeding. I have some fifteen acres of slash and loblolly seedlings that were set out this spring on an area that is noted for the Johnson grass that grows there. This grass is now about three feet high and promises to get higher. Will it kill the seedlings if it is allowed to go through the summer this way?

The Kiwanis Club of Cedartown invited Mr. C. A. Whittle to speak to them at their regular luncheon on Friday, June 7. Mr. Whittle gave a very interesting talk and there has been much comment in this section on the information that he gave them at this time. The Club presented Mr. Whittle with a very nice certificate showing that he had been their guest speaker.

ECW:

Camps P-87, Floyd County, and P-86, Walker County, are nearing completion. The forestry buildings are being erected under

the supervision of Foremen W. E. Brigham and A. W. Johnson. Both of these men were transferred from the Waycross district.

The camp at Ellijay in Gilmer County has just completed an eighty-foot steel tower and has started on another one in another section of the county. This will materially add to the effectiveness of the protection system.

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

On Tuesday night, June 7, the Walton County TPO was organized with an initial signed up acreage of 10,000. It is planned to extend the organization to cover the entire county.

The following men were elected as officers: P. N. Launuis, President; J. W. Butts, Secretary and Treasurer.

The assessment was set at 3 cents per acre.

On Tuesday night, June 11, the Tugalo TPO was formed with headquarters at Lavonia, Ga. It is planned to extend the area under protection into part of Franklin, Hart and Stephens counties. The initial beginning of the organization being 10,000 acres signed up. The assessment was set at 3 cents per acre.

The following men were named as officers: S. B. Yow, President; S. C. Vandiver, Vice-President; Thos. S. Porter, Secretary and treasurer.

On the 28th day of May the Dawson County TPO was formed with the initial beginning of 25,000 acres. It is planned to extend the organization on a county-wide basis. The county government agreed to aid in protection work to the extent of \$400.00 per year. The assessment was set at 3 cents per acre on signed up land.

The following men were named as officers:

J. Silvey Harbin, President; H. B. Faucett, Vice-President; Claude E. Boggs, Secretary and Treasurer.

FOURTH DISTRICT

**W. G. Wallace, District Forester
Columbus**

Pine Mountain State Park

The beautiful State park being developed on Pine Mountain between Warm Springs and Chipley by the CCC, offers advance indications of being very popular. Although all major projects in the park are incomplete, and roads are under process of construction, each Sunday witnesses hundreds

of cars of interested persons within the park. Very little publicity has been given out regarding this park, and of course it is months yet until it can be formally opened to the public.

The twelve mile scenic highway following the ridge of Pine Mountain from Tip Top near Chipley to Warm Springs is a most interesting drive. This is the principal means of access to the park either from Warm Springs on the east or the paved highway through Chipley on the west. We noticed recently that Harris County is greatly improving this beautiful road.

We are prone to think of Warm Springs when Pine Mountain is mentioned, and of course this is due to the publicity given Warm Springs and Pine Mountain because of President Franklin D. Roosevelt and the Warm Springs Foundation. Many people picture Pine Mountain as being a single mountain located at Warm Springs, whereas, in fact, it is a mountain range of ridges and spurs extending a distance of about sixty-five miles across Georgia from near Barnesville to the Chattahoochee River near West Point. Differences in elevation from mountain top to valley are in some instances more than 400 feet as compared to 650 feet for Stone Mountain near Atlanta. However, the scenic views offered by Pine Mountain far surpass that offered by Stone Mountain. Plan to become better acquainted with Pine Mountain and you have a pleasant surprise awaiting you. Its quaint ruggedness and magnificent views are something we do not expect to find 150 miles south of the Blue Ridge in North Georgia, yet it is a fact, and again I say you have a pleasant surprise in store unless you have already been initiated.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Ogeechee T. P. O.

The Ogeechee Timber Protective Organization, of which Mr. Elliott W. Reed, of Savannah, is Secretary-Treasurer, recently placed an order for a Diesel Tractor. The tractor will be used in maintaining primary fire breaks and truck trails constructed from E. C. W. funds. It will also be used in constructing secondary fire breaks on TPO lands.

The Secondary fire breaks will be constructed with a Hester Five Disc two way plow. The finished fire break of this type will average about 8 feet in width and should be very effective in fire fighting activities. It is planned to break up the large areas now containing from 700 to 1,500 acres into smaller areas with secondary fire breaks, using the new equipment the T. P. O. recently purchased.

The Ogeechee TPO protects lands in

Chatham, Southwestern Effingham and Eastern Bryan Counties. All protective work will be on a per acre assessment basis and all work will be supervised by the TPO Manager.

Oconee T. P. O.

The Oconee TPO now has a full time TPO Manager at work and contains over 115,000 acres with headquarters at Soper-ton.

The Oconee TPO contains all lands formerly in Treutlen TPO and extends into Southern Laurens, Western Toombs and all of Montgomery County.

When the Oconee and Treutlen TPO's were consolidated and reorganized the following officers were elected:

James Fowler, President

R. R. Walker, Vice-President

J. E. Hall, Secretary-Treasurer.

The Board of Directors consists of the following:

C. W. Phillips, J. B. Warthen, James Fowler, J. E. Hall, R. R. Walker.

All business in the future will be handled by the Board of Directors, Officers of the TPO and the District Forester.

The TPO plans to buy a tractor and plow for use in maintaining truck trails and primary firebreaks, constructed from ECW funds. This equipment will also be used in constructing secondary fire breaks. All TPO work will be done under the supervision of the TPO Manager and all phases of protection will be financed on a per acre assessment basis.

SEVENTH DISTRICT

C. Bernard Beale, Dist. Forester
Waycross

Woods-Burner Sentenced to Gang in Appling

Secretary Jean M. Du Puis, of the Appling TPO, writes as follows: "This will advise you that in a trial May 13, the jury found Bagen Hesters guilty of setting Bob Crosby's woodland on fire. This man was sentenced to serve six months in the chain-gang or pay a fifty-dollar fine and the costs of court. He has no one to pay his fine and most probably he will have to serve his sentence.

"This was a very hard case as all the evidence was circumstantial. Due to circumstantial evidence the jury asked for mercy of the court.

"I have four other cases to be tried but due to not having all our ownership and land titles as the prosecuting attorney wanted them, they were postponed to next term of court."

"Testimony was offered to show that Hesters was paid one quart of corn whisky to burn the woods for a neighbor's three or four cows."

Mr. DuPuis has done some excellent work in furthering the prosecution of these cases and it is hoped other TPO secretaries will follow his example.

Brunswick-Penn. T. P. O. Expands

An expansion from 20,000 acres to 80,000 acres has recently been achieved in this TPO. It is understood that Glynn county has agreed to finance the employment of a full-time secretary for this TPO as soon as the acreage reaches the 100,000 mark. Definite progress is being made by this TPO and we hope it will soon rank among our best.

Beckley T. P. O. Active

This TPO, located in the vicinity of Bickley, in northern Ware county, comprises only 12,000 acres, but all of its members construct firebreaks and are active in keeping down fires.

Brantley T. P. O. Prosecutes Woods-Burner

E. G. Strickland, secretary, reports that prosecution has been entered against Mrs. Lydia Stone Crews, caught by a patrolman firing the woods of K. S. Varn, near Race-pond.

Camden T. P. O. Assisted by County Patrolmen

K. G. Meschke, secretary, writes that during the dry season this spring the County Commissioners employed three patrolmen to supplement regular TPO forces to apprehend woods-burners. It is understood that one of the worst woods-burners in that area was recently apprehended on a boot-legging charge.

Consolidated T. P. O. Has Picnic for Towermen

An outing for the towermen manning the ten towers of this TPO was recently given by the board of directors at Lang's mill-pond, Secretary Rodgers advises. All of the towermen rendered faithful service during the past season and the directors expressed their appreciation for their loyal service.

Mr. Rodgers also reports the addition of several thousand acres and states that 20,000 additional acres is in prospect. The secretary of this TPO has a big job and is working diligently to make this one of the best TPO's.

Charlton TPO Expands

L. J. Stokes, secretary, has recently succeeded in securing a 20,000-acre addition to this TPO, making a total of 206,000 acres.

Coffee-Jeff Davis to Add Ben Hill-Irwin Lands

L. F. Morey, secretary, advises that the directors recently approved employment of an assistant secretary to handle the increase anticipated of approximately 30,000 acres in Ben Hill and Irwin counties.

Hurricane Creek Adopts Fire Protection Plan

A fire protection plan, requiring all members to construct firebreaks and maintain a

minimum amount of suppression equipment was recently adopted by the directors, according to P. B. Copeland, secretary.

Application for a side-camp from P-62 to construct several towers and telephone lines on this area is now in preparation.

Suwanee Increases Membership

Several new members are expected to be listed in this TPO at an early date. W. M. Oettemier, secretary, advises. Approximately 4,000 miles of secondary firebreaks have been plowed on this area. Due to radio control of suppression crews, less than 1,500 acres are reported burned on this 275,000-acre area.

Lady Tower-"men" Used by Wayne

Secretary E. L. Knight, of the Wayne TPO has two young ladies in his tower personnel, one "manning" the tower at Odum and the other at Broadhurst. Both Superintendent Sanders of the CCC camp and Secretary Knight will vouch that the feminine observers are highly efficient and get all the smokes promptly.

CCC ITEMS

P-62, Baxley—Maintenance of the wooden TPO towers in this county has recently been completed under the supervision of A. L. Sutton. Maintenance consisted chiefly of painting the towers, which was done at a cost of \$1.50 per tower for materials. Burned motor oil was used as a body for the paint.

P-65, Jesup—Having completed the erection of two cypress and one steel tower in Wayne county, we are now in the process of painting the wooden towers and beautifying the grounds. We expect to complete all of this long before next fire season.

SHOULD STONE MOUNTAIN BE COMMERCIALIZED

The recent proposal to build a casino on top of Stone Mountain and construct a highway to it is arousing the ire of a lovers of the natural beauty of Georgia's most famous mountain which has been dedicated as a memorial to the Confederacy. The proposed road would start at the west end of the mountain, circle the south and east ends in an ascending spiral, and cross the crest of the vertical north face on which the Memorial to the Confederacy is partially completed. It would necessitate the blasting out of thousands of tons of granite, spoiling the natural profile of the mountain when viewed from the base. The casino would stick out like a sore thumb. There is grave danger that the heavy blasting for the road would open up minute seams or cracks in the granite and cause damage to the Confederate Memorial.

It is to be hoped that the people of Georgia will realize the importance of preserving Stone Mountain in its natural state and will take steps to prevent desecration of this historic mountain.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

GEOLOGICAL MUSEUMS IN GEORGIA

By LANE MITCHELL

The Georgia State Museum authorized by the legislature in 1889 was given real substance in 1895 when the Georgia exhibit from the Cotton States and International Exposition held in Atlanta was turned over to Prof. W. S. Yeates, then

Although thousands of school children and other interested persons visit the state museum annually, many Georgians have never had the opportunity to do so. To remedy this situation a program of expansion for the state museum is being planned. A number of wayside museums in the various state parks are planned by the Park Service, each museum to especially illus-

cases which can be locked to protect the specimens. (3) The museum must be reasonably well cared for and maintained. Otherwise it must be shipped back to the State Geologist. The museums provided include 75 specimens of minerals, rocks, and clays gathered from different localities. Each specimen is numbered according to its classification as a mineral, rock or clay and a printed label bearing the name, number, source, and name of mine or company. A wooden display block is also furnished.

The State of Georgia embraces portions of the following physiographic divisions of the United States: Coastal Plain, Piedmont Plateau or Central Upland, Appalachian Mountains, Appalachian Valley and Lookout Mountain Plateau. The Coastal Plain is underlain by sands, clays, and limestones which have been transported from the northern part of the State and deposited in the ocean which once covered this area. The Piedmont Plateau and the Appalachian Mountains are underlain by very ancient crystalline rocks and are often spoken of as the Crystalline Area. The Appalachian Valley and Lookout Plateau are underlain by old sedimentary rocks (sandstones, shales and limestones) of Paleozoic age. This diversity of underlying rocks gives Georgia a wide variety of rocks and minerals.

Figure 1 shows the extent of the Coastal Plain, Crystalline Area, and the Paleozoic Area in Georgia and shows by numbers the locations from which the samples for the school museums were obtained. A descriptive list of the minerals follows. The numbers correspond to the numbers on the specimens and the numbers on the map.

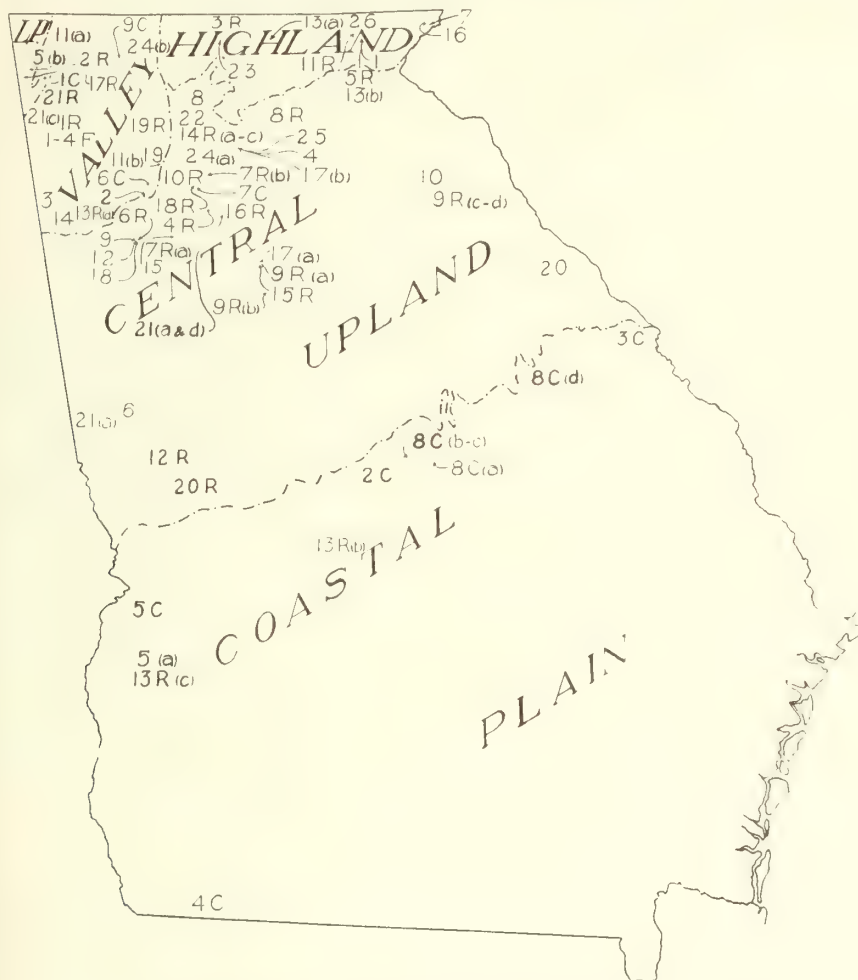
(1) Anthophyllite Asbestos is a fibrous form of amphibole, a magnesium-iron silicate. The short fibres of the Georgia variety render it unsuitable for spinning, although it is serviceable for insulation, etc. It occurs at many places in north central and northeast Georgia, especially accompanying the ultra-basic rocks.

(2) Barite, barium sulphate, occurs in the Cartersville area in Paleozoic ocherous beds. It is used in paint manufacture and in the manufacture of barium chemicals.

(3) Bauxite, aluminum oxide ($Al_2O_3 \cdot 2H_2O$), occurs in the Paleozoic area of northwest Georgia and at several places in the Coastal Plain region. It is the ore of aluminum and alum.

(4) Beryl ($Be_3 Al_2 (SiO_3)_6$) is found in the pegmatite dikes of the crystalline area, generally as hexagonal prisms, associated with mica and tourmaline. Green, blue, aquamarine and golden beryl have been found. No emeralds have yet been discovered in this state. Its uses are as gems, special refractories, and alloys.

(5) Calcite, calcium carbonate ($CaCO_3$), is the principal constituent of cave onyx, marble and limestone. The lime solutions in underground caverns give rise to stalac-



Index map showing physiographic provinces and localities from which school museum specimens have been obtained.

State Geologist and curator. Since then it has been added to from time to time by other exhibits collected by the State Geological Survey, the Forest Service and the Departments of Entomology, Agriculture, Education and Game and Fish. The exhibits provided by the Geological Survey concern economic geology and mineralogy, ethnology, archaeology and paleontology. The museum occupies the corridors on the fourth floor of the state capitol and State Geologist Richard W. Smith is the curator.

trate resources of the area served by the park.

In connection with this expansion program the State Geologist is proceeding to place museums of the common rocks and minerals of Georgia in at least one school in every senatorial district of Georgia. Distribution of these museums has already begun. Compliance with certain conditions are asked of recipients of these museums. (1) Cost of shipment must be borne by the recipient. (2) There must be provided glass

tites and stalagmites of cave onyx, generally in beautiful and fantastic shapes. Caverns are found in areas of limestone in northwest Georgia and in the Coastal Plain.

(6) Chromite, an oxide of iron and chromium (FeCr_2O_4), is found near Louise, Troup County, Georgia, associated with ultra-basic rocks. It is used in the manufacture of refractories, rust-proof alloys, and in plating.

(7) Corundum, aluminum oxide (Al_2O_3), occurs in numerous places over the crystalline area of Georgia. Its former use as the principal abrasive has been largely supplanted by the artificial carborundum. Gem varieties such as rubies and sapphires have been found in Georgia.

(8) Dolomite, a carbonate of calcium and magnesium (Ca, Mg CO_3), is quarried in northwest Georgia for use as a monumental marble, for filler, and agricultural lime.

(9) Almandite Garnet, a silicate of iron and aluminum ($\text{Fe}_3\text{Al}_2 (\text{SiO}_4)_3$), occurs generally throughout the crystalline area of Georgia. It is a common constituent of the Carolina gneiss, the most prominent rock of the area. It is also found in many other rocks such as the chlorite schist of west central Georgia, from which large specimens have weathered free and accumulated on the surface of the ground. Almandite garnet has been used for abrasives but is rarely suitable for gem stones.

(10) Graphite, the crystalline form of carbon (C), is known to occur in Madison County. Amorphous graphite schists are known in several other localities. The Georgia material is used mainly in foundry facings.

(11) Hematite, the red iron oxide (Fe_2O_3), occurs as the fossil iron ore in northwest Georgia and as specularite in the crystalline area. It is used as a paint pigment and in iron and steel manufacture.

(12) Hornblende, a complex silicate containing iron, alumina, magnesium, and calcium, is a common constituent of the Roan gneiss occurring over wide areas in the crystalline region of Georgia. It occurs also in massive form as the wall rock in the pyrite mines of Paulding County. It has no commercial use.

(13) Kyanite, an aluminum silicate (Al_2SiO_5), occurs throughout the area of crystalline rocks in mica schists, quartzite and quartz veins, the latter commonly cropping out as large massive boulders or "dornicks." Its use as a refractory material is rapidly increasing.

(14) Limonite, the brown iron ore ($2 \text{ Fe}_2\text{O}_3 \cdot 3 \text{ H}_2\text{O}$), occurs at several localities in the Appalachian Valley and in limited quantities throughout the State. It is mined in the vicinity of Cedartown.

(15) Magnetite, the magnetic variety of iron ore (Fe_3O_4), occurs at several localities in the Crystalline area, especially in Cobb and Cherokee Counties.

(16) Microcline Feldspar ($\text{KA1Si}_3\text{O}_8$), occurs in many places over the Crystalline area. It is a common rock-forming mineral and is the main constituent of granite and many other rocks. It is used in the ceramic industry in white-ware manufacture.

(17) Muscovite Mica ($\text{H, K AlSi}_3\text{O}_8$) is the ordinary white mica or "ising-glass," a common constituent of the crystalline rocks. Large "books" of sheet mica are found in pegmatite dikes. It is used in stove windows and as an insulating material in the manufacture of electrical equipment.

(18) Pyrite, iron sulphide (FeS_2), is often called "fool's gold" because of its metallic yellow color. It occurs in different forms throughout all of Georgia. Large crystals are found in the crystalline area, where it was once mined for manufacture of sulphuric acid.

(19) Pyrolusite, a form of manganese oxide (MnO_2), occurs as a soft sooty coating on rocks throughout the state and as hard masses of needle-shaped crystals in the Cartersville district. It is used mainly in the steel industry. Georgia is among the leading domestic producers.

(20) Pyrophyllite, a hydrous aluminum silicate, occurs on Graves Mountain in Lincoln county, Georgia. The Georgia material is widely sought for cabinet specimens but is not used as a filler and talc substitute, as is the material mined in other states.

(21) Quartz, silica (SiO_2), occurs as the rock crystal and massive vein quartz in Crystalline Georgia, as sand over the whole state and as chalcedony in northwest and south Georgia. Uses of various forms of quartz are too numerous to list here.

(22) Sericite Schist ($\text{(H, K) AlSi}_3\text{O}_8$), is found at many places in the area of crystalline rocks but commercial varieties are mined only in Pickens county. It is used as a filler, foundry facing material, and a talc substitute.

(23) Staurolite, a hydrous iron aluminum silicate, occurs in beautiful cruciform twin crystals in mica schist. The cross shape makes them very attractive as souvenirs and gem stones. The best Georgia specimens come from Fannin and Cherokee counties.

(24) Talc, a complex magnesium silicate, occurs in many places in the Crystalline area of Georgia. It is mined for filler, foundry dusting, soapstone pencils, cosmetics, and toilet preparations. The main source of the Georgia talc is near Chatsworth in Murray County.

(25) Tourmaline, a complex silicate of boron, aluminum and iron, occurs in the pegmatite dikes of the crystalline area. Large crystals are sometimes found associated with mica and beryl.

(26) Vermiculite, a complex hydrated silicate, is a golden colored mica coming into extensive use as an insulating material and a paint pigment. It is associated mainly with the ultra-basic rocks and occurs

GEORGIA MINERAL SOCIETY

The regular monthly meeting of the Georgia Mineral Society was held June 3 at the Central Y. M. C. A. in Atlanta. Prof. W. H. Vaughan, Director of the State Engineering Experiment Station at Georgia Tech, spoke on "The Function of Institutional Research in the Development of the Mineral Resources of Georgia," and showed moving pictures of the research work of the Engineering Experiment Station and of making pottery from Georgia clay, and other southeastern materials.

The next meeting of the society will take the form of a field trip to Graves Mountain in Lincoln County. Graves Mountain has world-wide renown among mineralogists because of the excellent specimens of rutile, lazulite, pyrophyllite, kyanite, and siderite which can be collected there.

Rich Find of Gold Nuggets

Another rich find of gold nuggets has recently been made at the gold mine of the Dixie Gravel Company, in charge of Mr. W. C. Hudson, on Dukes Creek in White County, according to State Geologist Richard W. Smith. This mine, which is near the site of the first discovery of gold in Georgia in 1829, has been in successful operation for over three years. Most of the recovery has been in the form of gold dust, but last fall a number of nuggets were recovered, 67 of which were on display at the State Capitol for several weeks.

Mr. Hudson has informed Mr. Smith that the recent clean-up had a total value of \$824.51, which included a nugget weighing 60.1 pennyweight with a mint value of approximately one hundred dollars, one of 34 pennyweight worth approximately sixty dollars, and several worth between ten and fifty dollars. These nuggets were found lying on the bed rock or were recovered from the sluice boxes during the hydraulic mining and washing of the gold-bearing gravels of the creek valley. A large portion of the gravel was previously mined over during the past century and yields only fine gold dust. The nuggets are usually found in areas missed by the old miners.

Large-scale placer mining for gold is on the increase in White County. The present operations, in addition to Mr. Hudson's mine, include two drag-line excavators, a steam-shovel, and a slack-line excavator. A Minneapolis concern is moving in three more drag-line excavators.

Already 35,000,000 acres of land in the United States have been abandoned because of erosion, and 175,000,000 acres will be abandoned in the next generation for the same cause, unless preventive measures are employed, according to H. H. Bennett

in limited quantity at many places in the crystalline area.

(To be continued)

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DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 5

ATLANTA, GA., AUGUST, 1935

No. 8

ALEXANDER STEPHENS PARK IS DEDICATED

Several hundred Georgians gathered on the lawn at Liberty Hall July 18 to dedicate the Stephens Memorial Park and to honor one of Georgia's most distinguished sons, who, handicapped in many ways, became vice president of the Confederacy and governor of this state.

Through the combined efforts of the United Daughters of the Confederacy, the State Department of Forestry and Geological Development and the federal government, through the civilian conservation corps "Liberty Hall", the home of Alexander Stephens has been restored to its former beauty. It was formally dedicated as a Southern Shrine on July 18.

Judge Manning J. Yeomans, State Attorney-General, made the principal address. Judge Yeomans spoke in the place of Governor Eugene Talmadge, who was prevented by official business from being present.

In his statements, Judge Yeomans praised the distinguished Georgian very highly as a leader and a statesman, characterized him as a man who stood for the things that were for the betterment of his state and her people—always being very positive in his statements and determined in carrying out what he believed for the best of the state as a whole.

"Stephens, when he attended the University of Georgia, roomed with Crawford W. Long. These two young men in later life became two of the nation's most distinguished sons", Judge Yeomans said.

"Stephens was the first and only vice president of the Southern Confederacy, a member of Congress and Governor of Georgia. Long became the discoverer of ether as an anaesthetic."

At the beginning of the ceremonies, Miss Isabel Allen of Social Circle presented a check in behalf of the Children of the Confederacy in honor of Miss Mildred Rutherford, of Athens, and Alexander H. Stephens.

Speakers at the bench dedication were: Mrs. Frank Dennis of Eatonton; Mrs. N. M. Jordan of Tennille; Miss Mary Godwin of Social Circle; Miss Rose Walker Mayne, of Athens and T. Guy Woolford, of Atlanta.

Among those who spoke at the dedication of the park were: State Senator W. M. Lester of Augusta; Charles D. Redwine, of Fayetteville, president of the senate; Judge and Mrs. Horace M. Holden, of Atlanta; R. B. McWhorter and F. G. Mitchell, Sr.

Leaders in the movement to restore and beautify the grounds and the dwelling house were introduced, and included: Mrs. M. E. Judd, Dalton; Mrs. T. W. Reed, Athens; Hawes Cloud, Crawfordville, who made the address of welcome; J. M. Mallory, Savannah, and State Forester B. M. Lufburrow.

Stephens Memorial Park covers approximately 200 acres in Taliaferro county and has been improved by a CCC camp under the direction of the State Department of Forestry and Geological Development. Mr. Stephens' home, known as Liberty Hall, occupies a prominent place in the park, and on the lawn in front of the house is a monument to Stephens and his grave is at the foot of the monument.

"WHO'S WHO IN THE SOUTH"

*A Business, Professional and Social record
of men and women of achievement in the
Southern States.*

1927

Published Biennially

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STONE, Bonnell Harold—Forester. Born at Oxford, Ga., December 3, 1887. Son of Harry Harlan and Susie (Bonnell) Stone. Ed: Palmer-Stone H. S., Oxford, Ga., 1902; Emory Col., 1908; U. of Ga. Forestry Sch., 1913. Forest Examiner, U. S. Forest Service, 1911-12; Pvt. Forester, Agt., Pfister and Vogel Land Co., Blairsville, Ga., 1913 —; Rep., Union Co., Gen. Assembly of Ga., 1925-26; Auth., Ga. Forestry Act, 1925, point-auth., 2 gasoline tax laws. Mem: Exec. Com., So. Forestry Cong (ex-Pres.); Chmn., Exec. Com., Sec., Ga. Forestry Assn. Independent Order of Hoo Hoo; W. O. W.; I. O. O. F.; Kappa-Alfa; A. A. O. N. M. S. Church: Methodist Episcopal, So., Married Edna Ausland. Children: Edna Mildred (11); Bonnell Harold, Jr. (9); Edward Morton (7). Home: Blairsville, Ga.

NAVAL STORES SURVEY SOUTHWEST GEORGIA

Twenty-two Counties Contain More than Two Million Acres Classified as Naval Stores Land According to U. S. Forest Service Survey

Unit No. 2 of the U. S. Forest Service survey, embracing Dooly, Wilcox, Crisp, Ben Hill, Worth, Turner, Irwin, Tift, Berrien, Cook, Colquitt, Lanier, Lowndes, Brooks, Thomas, Grady, Mitchell, Baker, Decatur, Seminole, Miller and Early counties, containing 5,586,000 acres, has 3,020,400 acres of forest land, according to a survey made by the U. S. Forest Service which made a survey of the area last year and recently issued a preliminary report on the same.

More than two million acres, or approximately 78 per cent of the forest area, bear sufficient quantity of turpentine timber to classify it as naval stores land. The total number of turpentine trees is more than 120 million, of which 80 million, or approximately two-thirds, are round and between 3 and 8.9 inches in diameter.

The total number of working trees during 1934-35 was 13,695,000. The total working cups was 14,580,000. The total virgin cups 4,103,000, an increase of more than half a million over the previous year, and more than three million over 1932-33.

In this area are 126 stills. The bulk of the crude gum, or 86.3 per cent, used by the stills comes from leased land. The average production per crop in 1933-34 was approximately 48 barrels.

The number of operations was 461, with 13,334 cups. The operators classed as "Gum producer-seller" has 325 operations; those classed as "Operators", 86 operations; "operator and gum buyer", 25; "gum producer-shipper", 10; "operator, gum buyer, operator, gum buyer and custom distiller", 8; "operator and farmer", 7.

A bill proposing to place the state forest service of Ohio under the Agricultural Experiment Station has been defeated. The Society of American Foresters was active in opposing the measure.

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State Capitol, Atlanta
CLAUDE E. BOGGS, EDITOR

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MR. WHITTLE RESIGNS POST OF EDUCATIONAL MANAGER TO GO WITH SOIL CONSERVA- TION SERVICE

The resignation of Mr. C. A. Whittle as educational manager of the Department of Forestry and Geological Development is announced by State Forester B. M. Lufburrow. Mr. Whittle resigned July 1 to accept the position of assistant director of Soil Conservation Service in Georgia, with headquarters at Athens. His resignation was accepted with keen regret not only because of his constructive work with the department as director of education in co-operation with the vocational agricultural schools of the state; and as editor of this publication, but because of his genial and lovable personality, his interest in all the activities of the department and the high esteem in which he is held by every member of the department.

Mr. Whittle's experience and knowledge covers many different phases of educational work and publicity. Reared on a Tennessee farm, he was graduated from the University of Tennessee, where he studied agriculture. He entered the newspaper field and worked up to editorial writer; later on he became agricultural editor for the Georgia State College of Agriculture, then managing editor for the Soil Improvement Committee of the Southern Fertilizer Association. While holding this latter position, he edited Commercial Fertilizer.

Mr. Whittle has been president of the American Agricultural College Editors Association; fellow of the American Society for the Advancement of Science; is a charter member of the International Soil Institute, a member of the American Society of

Agronomy and American Botanical Society and was active for several years in the Southern Agricultural Workers Association and various agricultural societies in the south.

Mr. Whittle is a constant contributor of news items and articles to leading forestry and agricultural publications, on current subjects.

He has written a number of pamphlets and bulletins on scientific subjects, among them being a bulletin entitled "Plant Food and Soil Management" to accompany a set of charts of the same title. More than a million copies of this bulletin were used by vocational agricultural teachers and students of the south as a text, and about 2,000 sets of the charts were distributed. He has written a number of bulletins and leaflets on forestry subjects which are in constant demand, it being impossible to supply all requests.

For over six years Mr. Whittle has been with the Department of Forestry and Geological Development, serving in the capacity of educational manager. To him is due much of the credit for the educational program carried on by the department.

On the day of his last association with the department, the employees of the Forestry Division, the Geology Division, the ECW employees and the Park Service presented Mr. Whittle with a small token of their esteem. This was a club bag and a fitted case of toiletries.

The best wishes of every member of the Department of Forestry and Geological Development go with Mr. Whittle in his new field.

SMALL TURPENTINED TREES SUFFER HIGH MORTALITY

Investigations made in Georgia by the Southern Forest Experiment Station reveal a high rate of mortality for trees of smaller diameters compared to those of large diameters, when chipped.

In the flatwoods, trees 7 inches in diameter (8 feet from the ground) the mortality of longleaf pine was 10.5 per cent; slash pine 10 per cent. For trees 8 inches in diameter, longleaf mortality was 5.8 per cent, slash 2.5. For 9 inch diameter trees, longleaf 2.9 per cent, slash 1.3 per cent; 10 inch diameter, longleaf 1.2 per cent, slash 0.7 per cent; 11 inch diameter, longleaf 0.4 per cent, slash 0.5 per cent; 12 inch diameter, longleaf 0.1 per cent, slash 0.4.

It is noticeable that longleaf suffered greater mortality for all diameter classes below 10 inches than slash.

Dry facing, or the cessation of gum flow, was found to be greater on small diameter trees. For slash pine 7 inches in diameter the percentage of dry facing was 10.6 per cent; 9 inch diameter 2.8 per cent; 11 inch diameter 1 per cent; 13 inch diameter 0.1 per cent.

CLAUDE E. BOGGS, OF DAWSONVILLE, APPOINTED EDUCATIONAL MANAGER

The appointment of Mr. Claude E. Boggs of Dawsonville, Ga., as educational manager for the Department of Forestry and Geological Development, effective July 15, is announced by State Forester B. M. Lufburrow. Mr. Boggs succeeds Mr. C. A. Whittle, resigned.

For 4 years Mr. Boggs has held an important post with the state educational department, as principal of the Dawsonville High School and teacher of vocational agriculture. He is secretary of the vocational teachers association for the fourth district; also F. F. A. adviser for this district. He received his B.S.A. degree from the University of Georgia in 1929, and is well qualified for the position of educational manager.

COSTS OF HARVESTING PULPWOOD

Studies have been made by the Southern Forest Experiment Station to determine the average cost of harvesting longleaf pines 6 to 14 inches in diameter for pulpwood where there was a mixture of round and worked out turpentine trees.

The time required to cut a cord (160 cubic feet) of round wood pulpwood bolts five feet long, averaged 6.6 man-hours for trees 6 inches in diameter (DBH) to 4 man hours for trees 14 inches in diameter.

For turpentine timber, the time for harvesting 6 inch diameter trees is 7.4 man-hours; for 14 inch diameter trees, 4.2 man-hours.

Based on average hourly cost to the contractor of \$0.156 per man (including labor, tools, supervision) it cost \$1.04 to cut one long cord from round trees 6 inches in diameter and 62 cents per round tree 14 inches in diameter. Turpented trees cost \$1.16 and 66 cents according to the two diameter classes.

The cost of trucking the wood 26 miles was placed at \$2.68 per long cord.

RELATIVE RATE OF GROWTH SLASH, LOBLOLLY, LONGLEAF

On an area of ten year old planted pines at Bogalusa, Louisiana, measurements reported by the Southern Forest Experiment Station show that slash pine leads in height growth, and loblolly in diameter growth.

The height record in feet is as follows: longleaf 25.5; slash, 37.4; loblolly, 28.6.

The diameter measurements 4½ feet from the ground are as follows: longleaf 5.2 inches; slash, 7 inches; loblolly, 7.1 inches.

The trees are among 10,000 on a 12-acre tract. No attempt has been made to record the general average of height and diameter

FOWLER PLANTATION MECCA OF FOREST CARPET GRASS ENTHUSIASTS

An evidence that south Georgians are very much interested in supplanting wire grass with carpet grass in forested areas, is the delegations of timberland owners who have trekked to the plantation of James Fowler at Soperton in Treutlen county.

In 1931 Mr. Fowler began sowing carpet grass on his forest firebreaks and in his forests, and has found that native carpet grass comes in where wire grass and sedge grass are removed.

Among the results of his experiments, it is found that carpet grass does not grow on loose land such as exists on plowed firebreaks. To overcome this handicap, Mr. Fowler has fallen upon the plan of sowing rye on the firebreaks and then inviting everybody to turn the cattle on the rye to graze. In grazing, the cattle tramp the ground thoroughly, providing an ideal condition for carpet grass to start and grow on clean soil without competition.

Mr. Fowler has a pioneering habit. It was he who in 1925 began large scale planting of slash pine and provided the first information on what pines would do when so planted. The results were so phenomenal that Mr. Fowler gained national prominence. It was from his 7 year old pine plantation that the first paper was made from 7-year-old trees.

Without any publicity Mr. Fowler went about his carpet grass experiments, and now that so much is being said on the subject, it develops that he has something of value to offer out of his several years' experience.

MASTODON REMAINS FOUND AT SAVANNAH

A party of FERA workers digging a drainage ditch in the Sackville section of Savannah early in June uncovered a number of fossilized bones and a complete tooth seven and a half inches long and three and a half inches wide. Through the efforts of W. G. McNaughton and William Allen, of the Herty Laboratory, and J. M. Mallory, of the State Commission of Forestry and Geology, these bones were sent to State Geologist Richard W. Smith for identification. Mr. Smith identified these as remains of a mastodon, an extinct relative of the modern elephant that roamed the eastern United States in Pleistocene times when the northern part of the continent was covered with glaciers.

Through the co-operation of the Chatham County Relief Administration and Mayor Thomas Gamble, a project has been started to search for more of these interesting remains. The work started June 18 under the direction of Lane Mitchell, Assistant State Geologist. Any further remains discovered will be studied and then housed in some local museum or the State Museum in Atlanta.

TRAINING LOCAL MEN IN TIMBER STAND IMPROVEMENT

Timber stand improvement on 8,626 acres in the Ozark National Forest, conducted by foresters and CCC men, was used as an opportunity to give local men training in the procedure. A few local men were taken on each day. It was found that it took three weeks to get a crew of 32 men well trained for the work. The local trained men can be drawn upon for future forest improvement work.

The average cost of treating hardwood thickets 8 to 15 feet high and 1 to 4 inches in diameter, breast high, typical of the area, was placed at \$3.24 per acre. This was based on allowing the forester \$1.00 an hour; labor 40 cents an hour. The average acre cost was divided as follows: 38 cents supervision, \$2.71 for labor of cutting; 13 cents for transportation. The cost per acre of the final month, when training the crews was not involved, was \$2.62.

DUST STORMS NOT NEW OCCUR IN OTHER LANDS

Such dust storms as have recently occurred in this country have occurred before and occur from time to time in other countries, according to the U. S. Weather Bureau.

In 1928 a dust storm in southern Ukraine, Russia, created such dense clouds as to turn day into night, and it is estimated that 15,000,000,000 tons of soil were carried away.

In 1901, storms in desert regions of Algeria in north Africa carried dust as far as 2,500 miles over Europe.

In 1902, a dust storm swept nearly the whole of Australia, obscured the sun and carried some of the dust as far as New Zealand.

Associated with dust storms in this and other countries are electrical displays in the form of "fire balls."

Private Owners Succeeding County-Wide Survey Shows

The May issue of the Forestry News Digest is devoted largely to a review of accomplishments of private land owners throughout the country. The review is not complete, but recounts many cases. For instance, no reference is made to a large number of large forest holdings in Georgia where forestry has been practiced for many years.

The instances reported are, however, a refutation of the often repeated statement that private forestry has failed. Numerous among the cases cited are lumber companies, the class often referred to as devastators, or ruin-and-run saw millers. These are proceeding very intelligently toward sustained yields and continuous operations.

In the issue State Forester Lufburrow makes a plea for greater aid for the private land owner and a better chance.

APPALACHIAN TRAIL CON- FERENCE

The seventh annual Appalachian Trail Conference was held June 22-23 at Skyland in the Shennandoah National Park, Virginia.

Warner W. Hall, Decatur, president of the Georgia Appalachian Trail Club, was on the program; also Joseph C. Kircher, regional forester of the U. S. Forest Service, Atlanta.

Private Forestry in South Makes Remarkable Progress

A. E. Wackerman, division forester of the Southern Pine Association, says in the May issue of Forestry News Digest, in discussing forestry on privately owned lands:

"Probably at least 20,000,000 acres in the southern pine region is now under forest management, far exceeding the minimum requirements of our rules of forest practice. To me, what has been accomplished by the lumber industry in sustained yield and improved forest management generally, is truly remarkable and especially so in the face of a passive and tardy interest on the part of the public."

Aphid Damage Abetted by Honey-Dew Hungry Ants

Attention of the Georgia Forest Service has been called to unusual aphid damage this season. Leaves on many trees have curled up and died under aphid attacks.

Abundance of aphids means a generous amount of honey dew for ants. Certain species of aphids that spend part of their life under ground are wards of ants. The ants take upon themselves the transportation of aphids from one place to another when the aphids are in need of food. Ants have been observed to caress the aphids to induce them to excrete honey dew. Because of the dependence of the ant on the producers of honey dew, the aphid has long been designated the "ant's cow."

MOLD ON "HEELED IN" SEEDLINGS

As a result of "heeling in" black locust seedlings in heavy soils that tend to waterlog, previous to planting, H. C. Maginnis of the Southern Forest Experiment Station, found that 50 per cent of the seedlings had to be thrown away because of a mold that attacked the roots.

Seedlings kept in well drained sandy soils escaped the trouble.

Pennsylvania Forest Tax Law Unconstitutional

The Pennsylvania forest law setting up "auxiliary forest reserves," taxable at \$1.00 per acre and a yield tax on harvested products of 10 per cent, has been declared unconstitutional, on the ground that the constitution requires a uniform system of taxation.

SEARCH FOR GOLD IS REASON GIVEN FOR DESIRING CCC CAMP

Robert Louis Stevenson's tales of the search for gold on Treasure Island would really come true for a group of CCC boys, if a camp was established in the area proposed by one of Georgia's citizens in a recent letter received by the state forester.

Among the many requests which the state forester has received for the erection of CCC camps in various localities of the state, is a letter from a Georgian who tells in minute detail of two tracts of land on which \$35,000 in gold is buried.

The writer of the letter says that he doesn't "no how they (CCC camps) are put on, whether land is purchased by the government", but that the section he names "had as fine timber as ever grown any where in any section and I think it would be a best adopted for it again for a reforestation camp."

A friend of the letter's author, it seems, sold two lots of timber to a large lumber company, for which he received a total of \$35,000 in gold coin. The gold coin he "berried in one of these tracts of land of 490 acres." The writer of this letter then says that he bought the timber of 140 acres from his friend in 1905 but was allowed to pay in bills or either in silver or gold.

According to the gentleman, "Records will show the reason Mr.— demanded gold for his pine timber was a turpentine company least these pine tracts at first and paid Mr.— large sum of money and he berried it and it roted (rotted). So when the turpentine lease run out and the lumber co. went to buy his timber, he told them the only way they could get it was to bring him the money in gold & they did, \$20,000.00 for first tract and \$15,000.00 for 2nd tract and he berred it and its never been found so to kill to birds with one stone I think it be a fine place for a CC Camp & while working reforesting the money could be found."

The gentleman who sold the timber has since died, according to the letter, and the gold remains in the land. It seems that the old fellow "never made a dollar. It just growed on him," according to the information sent to Mr. Lufburrow. "He said he paid \$25.00 for one tract of 490 acres, and give a water berry watch for 490 acres and he give a old single-barreled shot gun for 490 acres way back when land was cheap and with all this find pine timber on it that got to valuable, and the owner said the woods was full of deer when he located there and he killed a many one and he had a outhouse of deer horns and lots of old relics."

It is not possible for the CCC boys to satisfy their thirst for adventure by hunting for adventure by hunting Georgia's buried gold, because the law says "No" emphatically. There are lots of other things that the CCC camps are prohibited from

doing too. Requests come in for camps to be established in various localities, some requesting that the boys may clean off the cemeteries; but this is another kind of work that is out of line with the forestry program.

Still others request that camps be established in their communities because there are good springs located in the area, or because there are excellent drainage facilities, and for many other reasons. They do not stipulate any particular kind of work they would like to have done in their respective communities.

Unfortunately, there is nothing to be done about these many requests. There are definite regulations which control the erection of these camps in the state. They definitely state that camps must be located on land that is in a timber protective organization which is cooperating with the state Forestry Department in forest fire control. No other camp site can be recommended except one located in the bound of such an organization.

There are specific laws which regulate the kind of work these camps can do. Cleaning cemeteries and searching for buried gold are unfortunately not included in the list. Otherwise, the Department of Forestry might assist in discovering the lost riches of a past generation.

VOCATIONAL FORESTRY CAMP

As this issue of the Review goes to press, the vocational forestry camp is gathering for its annual session. The camp is being held at North Georgia College, Dahlonega, and an attendance of 110 boys besides teachers is expected. The September issue of the Review will carry further details.

PRESIDENT ROOSEVELT PLANS NEW FOREST LAW PROGRAM

Legislation Covering 15 Years Suggested in Letter to Sen. Fletcher

A forestry legislative program for the nation that looks ahead 15 years is in the making. President Roosevelt has outlined his idea to Senator Duncan U. Fletcher of Florida.

The president wants to provide for public acquisition of forest lands for the shelter belt and for unemployment relief in making public forests fully productive.

In replying to a letter of inquiry from Senator Fletcher, President Roosevelt writes that he "hopes for a rounding out of existing legislation supplemented by new provisions and altogether something which will supply an organic basis, so far as we can now foresee it, for the next 10 to 15 years."

RESOLUTION PASSED BY THE COMMISSION OF FORESTRY AND GEOLOGICAL DEVELOPMENT AT QUARTERLY MEETING JULY 11, 1935

In the death of Mr. Bonnell Stone, which occurred at his home at Oxford, on May 25, 1935, Georgia has lost a loyal and useful citizen, and the cause of forestry a pioneer who was a constant and devoted advocate of the best forest practices.

It was largely through his efforts that the Georgia Forest Service was established. The Southern Forestry Conference honored Mr. Stone with the presidency of the organization and he was the founder of the Georgia Forestry Association, which he served as president, chairman of the executive committee and secretary.

Vogel State Park at Neel Gap was donated to the state through his influence, which led him to vision a statewide park system.

He was a member of the State Forestry Board for several years where his knowledge, experience and enthusiasm contributed much to the plans and deliberations of the board.

Over a period of years the members of this Commission enjoyed the association and treasured the friendship of Mr. Stone.

Resolved: That we mourn the untimely passing of our colleague and extend to Mrs. Stone and the other members of the family our sincere sympathy.

Resolved: That the secretary be instructed to forward to Mrs. Stone a copy of this tribute and that it be spread on the records of this Commission.

MRS. JUDD MEMBER OF COMMISSION PAYS TRIBUTE TO BONNELL STONE

In paying a tribute to Bonnell Stone, which I consider it a privilege to do, I am going to confine my comment to just a few words of appreciation.

I think I never knew a man who was more unselfish than Bonnell Stone. His loyalty and love for his state, his wonderful vision as to the value of forestry, his appreciation of the advantages of state parks, carried him too far in his devotion to these things, for it literally took his life, inasmuch as he neglected his own health repeatedly to do for the state.

Having worked with Bonnell Stone for fifteen years, I knew him well. His nickname for me was "Pard", and I shall always appreciate the knowledge I gained from that friendly association with such a fine spirit.

I am saying to Mrs. Stone that in my memories of Bonnell, I shall always strive to follow to the goal set by Bonnell in his vision for the splendid things for Georgia which he hoped would come to pass.—Mrs. M. E. Judd.

SIXTH DISTRICT

Jack Thurmond, Dist. Forester
Savannah

CANOOCHEE RIVER T. P. O.

Early in July, a meeting of members of the old Emanuel County TPO was held in Swainsboro and the TPO reorganized and is now operating under the name of Canoochee River Timber Protective Organization, protecting lands in Emanuel and Candler Counties.

A Board of Directors was appointed to manage the business affairs of the organization and includes the following men, who are all TPO members:

Mr. C. I. Hall—Swainsboro
Mr. J. W. Stephenson—Swainsboro
Mr. E. B. Lamb—Midville
Mr. B. Lewis Brinson—Swainsboro
Mr. Leon Ehrlich—Swainsboro

At this meeting a full time TPO Manager was employed to work the year around and take charge of all TPO work and manage the protective system, including the signing of new members, collecting assessments and supervising work of Lookouts and Patrolmen. The Canoochee River TPO is using a three tower detection system at present, the towers being purchased by the TPO. In the near future, one additional tower will be constructed.

NEW T. P. O. MANAGER

The Liberty-Long Timber Protective Organization, covering lands in Liberty, Long and part of McIntosh Counties, have a new manager who started to work on July 1st.

Perry W. Gordon replaced R. E. Banks as Liberty-Long TPO Manager and is doing some very fine work. Mr. Gordon is a native of this section and is familiar with TPO work, having spent two years at Camp P-53, Hinesville, as a Local Experienced Man. The TPO acreage and treasury balance has increased quite a bit since Mr. Gordon started work.

OGEECHEE T. P. O.

The Ogeechee TPO, covering land in Bryan, Chatham and Effingham Counties recently put on a full time TPO Manager, Mr. Perry Hubbard. Mr. Hubbard will take charge of all TPO affairs and has his office in Savannah.

Mr. Hubbard is hard at work signing up new land and getting new members for the organization and we feel that the TPO will be much better off with Mr. Hubbard as Manager, who can spend all of his time working for the organization.

EIGHTH DISTRICT

H. D. Story, Jr., Dist. Forester
Albany

Matters are progressing smoothly at the Albany Nursery, although some casualties are noticeable in the seed bed due to sun scorch, caused by extremely dry weather and hot days.

The walls of the 30,000 gallon storage tank being constructed at the Nursery with FERA labor furnished by the District Office, have been poured in good shape and as soon as these walls have had time to season the bottom will be poured.

The installation of this ground reservoir will greatly improve the irrigation system previously installed which has proven inadequate for our present needs due to the increased acreage of seed beds taken in this year in an effort to meet the ever-increasing demand of the state for planting stock.

The increasing interest in artificial reforestation by the land owners of the state is evidenced by the number of orders that are arriving daily, which to date greatly exceed the total sales of last year.

Wonderful co-operation has been given the Department through the local FERA office, who has assisted in several projects at the Albany Nursery.

The camp site has been cleared, buildings staked and well bored on the site of the Lanier County camp to be constructed and occupied sometime in the near future.

Lanier County is very much interested in the protection problem and Mr. Tom Murray has been selected as full-time secretary of the Grand Bay T. P. O. of this county. Mr. Murray has been at work for several weeks getting the organization's business in shape and he is of the opinion that things will work along in smooth order.

The Berrien County T. P. O. of Berrien County has recently employed Mr. C. E. McMillan, of Alapaha, Georgia, as Secretary of the organization and everything seems to indicate that business matters of this organization will be in good shape by the time active work is begun on the land listed for protection.

The camp site has been cleared, buildings staked, and the well bored on the site to be occupied by a company of approximately 200 men which are expected in the near future. No actual construction of buildings has yet been started.

P-68, Douglas—P-68, Douglas, has completed two 100 ft. steel lookout towers since April 8. The tower crew will be converted into a bridge and culvert crew. Construction on telephone lines and converting pri-

mary breaks into truck trails is well under way. Objective is construction of adequate system of communication and transportation by next fire season.

DISTRICT FORESTER BEALE ACCEPTS GOVERNMENT JOB**Resigns Post at Waycross, after six Years.**

C. Bernard Beale, district forester with the Georgia Forest Service, located at Waycross, Ga., has resigned after six years work to accept a position with the Federal Soil Conservation Service. Mr. Beale's headquarters will be Athens, Ga., where he will be the forestry expert for a soil erosion camp.

Under Mr. Beale's administration as district forester, there has been a remarkable growth in timber protective organizations, a total of 2,125,000 acres in his district being under organized protection.

Mr. Beale has done outstanding work in coordinating the work of the timberland owners, the timber protective organizations and the CCC camps.

INTERESTING FOREST FACTS

It is estimated that thousands of tree branches are used yearly to punish naughty children.

(Editor's note:—This used to be the case, but correcting children has long since gone out of style.)

The annual rings of growth in a tree will not only tell the tree expert the exact age of the tree, but will also show him whether each year was dry, wet, or partially so. Without knowing in advance, the expert tree ring reader can tell about the section of a country in which that tree grew. Thus trees record history.

Many trees give forth musical and singing sounds, which make them, under the influence of wind effects, seem to have a human side. For example, the oleander of Texas, under the influence of light breezes, plays and sings all night. The trembling aspen sounds like tinkling bells. The Chinese umbrella tree is called the "laughing tree" because of its mirthful sounds. The redwoods seem to roar and bellow, cedars whistle, and mangroves sound as though they were grunting. Elms flop and snap like kettledrums. The banana trees sound like a bass drum, the catalpa howls, the sassafras whinnies, and the osage orange hisses.

Wood completely submerged in fresh water—not mud—will not decay easily. The destroying salt water organism, however, will decay wood much faster.

The Service Letter,
Pennsylvania Dept. of Forests
and Waters.

Mineral Development Basic To Industrial Progress

Every state in the Union produces, to some extent, minerals. Nobody seems to clearly understand that our industrial prosperity actually rests upon a mineral structure, its healthy condition and its efficient utilization. There are 3,071 counties in the United States, 2,024 of them are mineral producers. Minerals enter into practically every phase of our present-day civilization. Among the industries by-product to minerals are motion pictures, tableware, kitchen utensils, automobiles, railroad rails and coaches, wire, roofing and building materials, printing, chemicals, plumbing, ink, paints, medicines—in fact, practically every phase of human endeavor and every phase of human existence, necessity, comfort and luxury depend upon a mineral base.

In all of its ramifications—mining, refining, processing and merchandizing—approximately 25,000,000 persons are dependent upon minerals for a livelihood. Minerals are capable of producing in a single year some seven billions of wealth. They pay better than 22 percent of the total Federal income and, in addition, pay huge sums for local and state taxation.

This gigantic enterprise, known as the second largest industry of the United States, is probably the most important factor in our industrial life today. Real consideration should be given to it by state and national government. It should be aided and nurtured and should be looked upon as something more to be prized than the goose that laid the golden egg.—The Mining Congress Journal.

June Publication of the U. S. Bureau of Mines of Interest to Georgia Mineral Producers

3275. Metallurgical Division—Progress Report II. Studies on the recovery of gold and silver, by E. S. Leaver, M. B. Boyer, J. A. Woolf, R. E. Head, B. W. Gandrud, R. E. Evans, and F. W. Thackwell. 65 pp. 10 figs. Includes papers on amalgamation and cyanidation; amalgamation during fine grinding of ores, flotation of gold, effect of sodium sulphide; form and occurrence of gold in pyrite from a metallurgical standpoint—coated gold; investigations on southern gold ores; auriferous black sands of the Pacific coast; flotability of lead and silver jarosites.

Information Circular 6846. Placer mining methods of E. T. Fisher Co., Atlantic City, Wyo. by Chas. L. Ross and E. D. Gardner. 10 pp. 1 fig. Describes successful placer where about 2,800 cubic yards of gravel are dug daily and washed in movable plant with gold dredge trommel and standard dredge sluice boxes at a total cost of about 12 cents per cubic yard.

These may be obtained free of charge on application to Information Division, U. S. Bureau of Mines, Washington, D. C.

An Abstract of Bulletin 46, The Geological Survey of Georgia: Kyanite and Vermiculite Deposits of Georgia

By LOUIS M. PRINDLE AND OTHERS

A survey of the kyanite reserves of Georgia conducted during the summer of 1934 by the U. S. Geological Survey in co-operation with the Georgia Division of Geology led to the discovery of wide areas of a kyanite-bearing mica schist and isolated areas of kyanite in other forms and occurrences such as dornicks, placers, and in quartzite. The record of all properties visited for this survey and for previous examination is contained in Bulletin 46 of the Geological Survey of Georgia.

The kyanite is found in the Piedmont area which is bounded by the Fall Line to the south and the Cartersville Fault to the northwest. The only areas producing at the present time are in Habersham County in northeast Georgia and these properties are part of a U-shaped belt extending over into Rabun County and having an overall length of about 30 miles and a width of 1,000 feet or more. The average kyanite of the schists runs about 3 per cent iron and 3 per cent silica, but the placers yield a product containing only about 1 per cent iron. The Bureau of Mines is conducting experiments concerning the beneficiation of the schists material and predicts that this can be recovered and used when there is sufficient demand.

The vermiculite resources of Georgia have been only partly examined. The most promising deposits are in Towns County, near the North Carolina line.

The bulletin is sent free to interested parties on receipt of postage by the State Geologist, 425 State Capitol, Atlanta, Ga. The shipping weight is two pounds.

LANE MITCHELL.

A gazetteer of Georgia place names and streams is being compiled from all available maps by Mrs. Ella M. Watkins of the Division of Geology. This information will be most valuable to the general public as there has been heretofore little chance of locating isolated places or streams in a distant part of the state. The work has also resulted in an enlargement of the map library, which is fast becoming the most complete file of Georgia maps available. As no funds are at present available for publishing the gazetteer, information will be furnished to interested parties on request.

A salesman asked a doctor to make a hurry call to a neighboring town. Upon arrival, the salesman asked, "What is your fee?"

"Three dollars," said the physician, in surprise.

"Here you are," said the salesman, "the blamed garage keeper wanted to charge me \$15.00."

Aluminum Ores On Exhibition

Aluminum ores and products are now on display in a completely new exhibit in the State Museum in the State Capitol, Lane Mitchell, Assistant State Geologist, announced recently. Large pieces of bauxite, the ore of aluminum, together with unfinished and finished products ranging from kitchen ware, bottle caps, colored foil, collapsible tubes, and other well known uses to pieces illustrating modern application of the metal in structural units, propellers, pistons, and machined parts make up the interesting exhibit. The revision of this portion of the State Museum was made possible by co-operation of the Aluminum Company of America.

Steedley, Seymour and Edmondson Vocational Foresters with U. S. F. S. Survey

Arthur Steedley, Waycross; Harry Seymour, Bowman; and Clarence Edmondson, Pavo, three young men of the first group receiving certificates of vocational forester at the Vocational Forestry School camp of Georgia, were accepted as assistant technicians by the U. S. Forest Service in conducting a timber survey in the south.

They have been with the survey from the first and have worked from Georgia to Texas. Occasional letters from the three young foresters reveal that they are enjoying the work and learning a lot about practical forestry. All three expect to go to college and get degrees in forestry.

Squirrels Gnaw Metal Tree Tags

On the Bent Creek experimental forest near Asheville, metal tags have attracted the grey squirrel, which probably considered the shining piece of aluminum a challenge of some sort, tried gnawing them and much to the confusion of the research workers, have played havoc with the tags. A similar experience is reported from the Central Forest Experiment Station, the red squirrel being identified as the offender.

What is a Forester?

In quest of a simple but comprehensive definition of a forester, State Forester B. M. Lufburrow consulted Webster's dictionary to find among other statements, "One who lives in a forest." A more pertinent question than "What is a forester" is "What isn't a forester?" thinks Mr. Lufburrow.

When the umpire was leaving the grounds after a game he was approached by an irate fan.

"Where is your dog?" demanded the fan.

"Dog?" ejaculated the umpire. "I haven't any dog."

"The Helya haven't," bawled the fan. "You're the only blind man I ever saw who didn't have a dog."

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

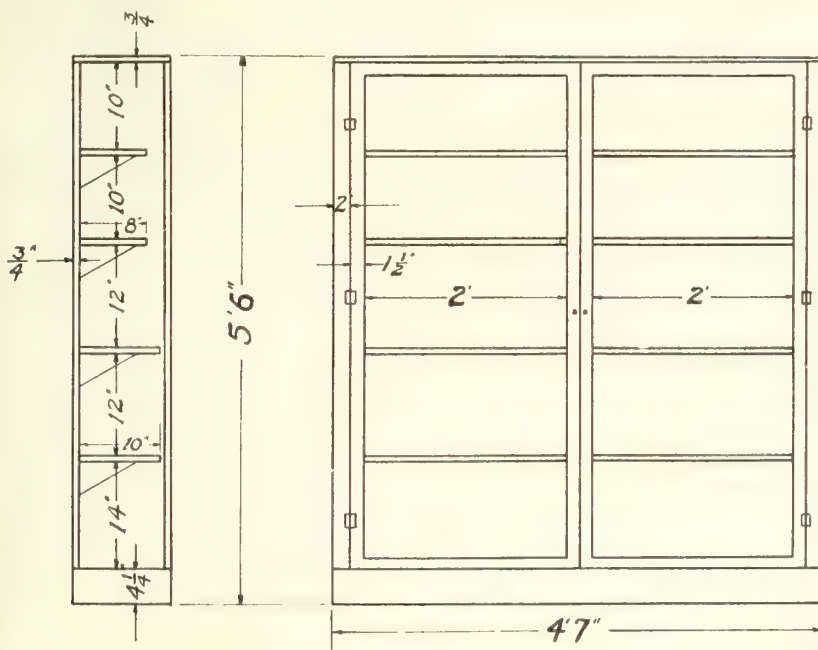
Reported by THE DIVISION OF GEOLOGY

GEOLOGICAL MUSEUMS IN GEORGIA

By LANE MITCHELL

The Division of Geology is preparing a number of museums of Georgia rocks and minerals for use in schools over the state. Seventy-five specimens, labels and mounting blocks are being furnished selected schools upon compliance with certain conditions. A brief description of the specimens is attempted in this series of two articles. Part one, published in the July number, described the minerals of the museum. The

understandable to students. A mineral is a natural inorganic substance of definite chemical composition. A rock is a natural portion of the earth's crust. Being a variable mixture of minerals its chemical composition is not definite. Rocks may be further classified as igneous, sedimentary, or metamorphic. An igneous rock is one formed from the solidifying of a molten mass, either deep beneath the surface of the earth as in granites or at the surface as in volcanic rocks. A sedimentary rock was formed by the deposition of rock-forming



Proposed plan for cabinet to display specimens of rocks and minerals. Two cabinets of these dimensions will be required to effectively display the seventy-five specimens furnished.

rocks and clays are described in the following article. The numbers correspond to those of the specimens and to those on the map published last month. The minerals were given simple numbers. The rocks were given numbers followed by the capital letter R and clays and earthy aggregates were given numbers followed by the capital letter C. Small letters indicated that specimens were obtained at more than one source. A series of fossil specimens designated by numbers followed by the capital letter F, is planned for future.

This division of the museums into rocks, minerals, clays and fossils was made in order to make their separate natures more

material by streams and oceans. Metamorphic rocks are those which have had their original characteristics changed by heat or pressure or both. They may have been either igneous or sedimentary before metamorphosis but the change wrought upon them is sometimes so great that the original nature can no longer be determined. We have distinguished clays from rocks merely in regard to the popular consideration of rocks as something hard and compact. A clay is an earthy aggregate having more or less plasticity when worked with water.

Rocks

(1R) Chert is a fine grained silica or flint rock formed by replacement of limestone.

It occurs in areas which have been under water such as the Paleozoic and Coastal Plain regions of Georgia. It is blocky and usually friable and is much used for road material. Chert may have almost any color or combination of colors.

(2R) Coal in Georgia is confined to the Lookout Plateau in northwest Georgia. One large mine and several small ones yield an excellent light-weight bituminous coal.

(3R) Copper ore in Georgia is found principally in the Ducktown Basin near the Tennessee line. Several old abandoned mines in this area yielded an ore consisting of pyrrhotite, chalcopyrite, and several silicate minerals. The copper was recovered from the small amount of chalcopyrite present.

(4R) Diorite is a coarse-grained igneous rock consisting of feldspar and hornblende. The Georgia variety has been metamorphosed and is found in many places in the Crystalline area. Kennesaw mountain is largely composed of this rock.

(5R) Dunite is a rock consisting mainly of the mineral olivine with chromite. It is found with ultra basic intrusions in the crystalline area. The rock is a possible source of olivine for use as a basic refractory. It is quarried in Rabun county for use as a road material.

(6R) Garnet-chlorite schist occurs extensively in west central Georgia. Garnets from this source might be recovered for use as abrasives.

(7R) Garnet-mica rocks are common forms of the Carolina Gneiss. A rock with large flakes of biotite, garnet and quartz is found extensively over the crystalline area. The fine grained garnet-sericite-graphite rock known as the Canton schist is found only in the Canton area.

(8R) Gold ore is confined mainly to several belts crossing the crystalline area in a northeast direction. The gold is found principally in vein quartz associated with sulphides such as pyrite, pyrrhotite and galena. The Dahlonega area is the scene of the most activity in past and present times.

(9R) Granites form a prominent part of the crystalline area of Georgia. The Stone Mountain, Lithonia and Elberton granites are of different age or texture. They are widely used in building, construction, and monumental work.

(10R) Graphite schist has been found in several localities in the crystalline area. It has been used as a filler for fertilizer. It is not mined at the present time. The amount of graphite in such schists is usually small.

(11R) Hornblende or Roan Gneiss is among the oldest rocks in Georgia. It has extensive occurrence throughout crystalline Georgia where it is sometimes quarried as a road material. Hornblende, biotite, quartz and feldspar are the principal minerals.

(12R) Itacolumite is a flexible sandstone. It contains feldspar and mica in addition to silica. Its occurrence is wide-

spread in the Warm Springs Area and is known in several other places in the crystalline area.

(13R) Hard limestone occurs in Paleozoic northwest Georgia and soft limestone in the Coastal Plain. A concretionary fossiliferous limestone capable of taking a high polish is quarried near Cuthbert in Randolph county for sale as "Travertine Marble." Both hard and soft limestone are used in manufacture of cement and agricultural lime.

(14R) Marble is a crystalline limestone composed of the mineral calcite. The white variety is relatively pure, the "Creole" has inclusions of magnetite and the "Etowah" has in addition inclusions of hematite which cause a pink color.

(15R) Pegmatite is an intrusive rock, similar to granite in composition but having a coarse and irregular crystallization of its minerals. Feldspar and Quartz are the essential minerals in the Stone Mountain pegmatites and black tourmaline and red garnet form prominent accessories. Some pegmatites contain commercial deposits of mica and beryl.

(16R) Quartzite is a metamorphosed sandstone, but its original sedimentary nature has been so much altered that it is often hard to distinguish from weathered vein quartz. It occurs in several localities, mainly at Pine and Oak mountains in the Warm Springs Area, at Sweat mountain in Cobb county and as the wall rock of the Tallulah River Gorge.

(17R) Sandstone is a sedimentary rock common in northwest Georgia and in the Coastal Plain. Its color depends on the stage of weathering and the impurities contained.

(18R) Serpentine is a metamorphic rock consisting mainly of the mineral serpentine. It is quarried at Holly Springs for use as a green marble, known as verde antique.

(19R) Slate is a metamorphic rock that splits into even thin plates and in Georgia is composed of many different minerals. A green slate is quarried at Fairmount for roofing material, both as splitting slate and as granules for the manufacture of composition shingles. Slates of a different color occur within the Valley Area and have been quarried in Polk county for roofing slate.

(20R) Trap rock or dolerite is the only known rock of Triassic Age in Georgia. It occurs in numerous dikes cutting the crystalline rocks in a northwesterly direction. It is composed of the minerals feldspar, olivine and pyroxene. At Talbotton it was formerly quarried for a road material.

(21R) Tripoli is a porous silica stone resulting from the breaking down of chert. It is used as a polishing agent and a foundry facing. It is mined in Walker and Chattooga counties.

Clay and Earthly Aggregates

(1C) Bentonite is an extremely plastic clay formed from the alteration of volcanic ash. They are used as bleaching clays in

filtering mineral and vegetable oils and as plastic agents in ceramic work and foundry mold making. Georgia bentonites are found at the base of Lookout Mountain and in the Coastal Plain.

(2C) Bleaching clay is the name given the clay formerly called Pike's Peak fullers earth. It is a very plastic clay especially suitable for use in bleaching vegetable oils. This type clay is mined in Twiggs and Wilkinson counties.

(3C) Brick clay is found in many different places. The requirements are good firing range, color, and good working properties. The Augusta clay fires to a deep red as shown in the briquette. The common red clay of the Piedmont is not a very good brick clay. The alluvial clays underlying swamp areas are usually satisfactory.

(4C) Fullers Earth is mined in large quantities in southwest Georgia for use as a bleaching clay for mineral oils. Georgia is a leading producer.

(5C) Marl is a clay with a high lime content. It is sometimes used with success as a natural soil conditioner. It is found extensively in the Coastal Plain. The dark-colored marl from near Louvale is typical but other colors are known.

(6C) Ocher is an impure earthy ore of iron or a ferruginous clay much used as a pigment in paints and mortars and as a filler in linoleum. The Georgia mines are near Cartersville.

(7C) Primary kaolin is formed in place by the decomposition of feldspar. Small deposits are found in a number of places in the crystalline area. It is of use in ceramic manufacture.

(8C) Secondary or sedimentary kaolin is found in the area of the Fall line across middle Georgia. The clays were transported from their original rocks and deposited along the shore of the ancient Cretaceous sea. The clays are very fine grained and are used in the paper and ceramic industries. Georgia is the leading producer. Variations in the hardness give individual clays certain properties which make them especially desirable for specific uses.

(9C) Shale is a consolidated sedimentary clay with well-marked laminations parallel to the bedding. It may be the first step of the process of alteration or metamorphism of clay into a slate. It is mined in northwest Georgia for use in the manufacture of brick, tile and sewer pipe.

The Division of Geology plans to add a series of fossil specimens to the school museums at sometime in the future. A number of fossils of Mississippian Age are found near Gore, Ga. Cup coral, blastoid heads, crinoid stems, brachiopods have been found there. Many other fossils of tertiary and quaternary ages have been found in the Coastal Plain.

Several schools have requested plans or specifications for a cabinet to display the mineral and rock specimens to be furnished them by this department. In order to be

of every possible assistance the Division of Geology submits the plans, illustrated, but merely as a suggestion. We do not even recommend that this cabinet be built in every instance. Perhaps glass inclosed book shelves in the library or cabinets already available will be more convenient. If sufficient floor space is available, a glass cabinet showing specimens from all sides would be ideal. However, most schools will probably desire wall cabinets. The above cabinet is designed for efficient display of the mineral and rock specimens. Detailed dimensions may be changed or altered at convenience. To display the seventy odd specimens two cabinets of the above dimensions would be required. If desired, one cabinet of twice the length of the above and with four glass doors instead of two would efficiently hold all of the specimens. It is suggested that adjustable brackets of the cantilever type be used to hold the shelves.

FROM A GEOLOGIST'S NOTEBOOK

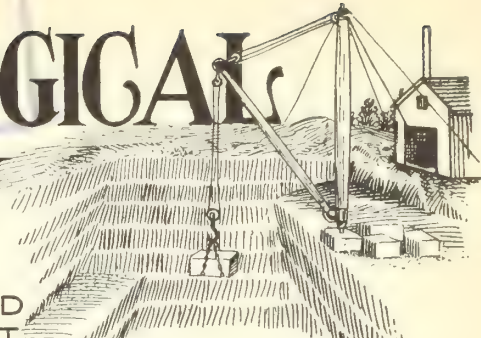
Mammoth, mastodon, and megatherium bones were recently uncovered in excavations made in the Sackville area of Chatham county near Savannah. Assistant State Geologist Lane Mitchell directed the corps of FERA workers who uncovered the fossil remains. The finds were made during the course of deepening an old drainage ditch paralleling Casey's Canal. The bones were stored in Savannah. Messrs. J. M. Mallory, W. G. McNaughton, Wm. F. Allen, and Ivar R. Tompkins constitute a group of Savannah citizens working diligently to find means of properly preserving and displaying the bones in Georgia. Several large museums have become interested in the discovery. Similar finds made a century ago in the same general area have received world wide attention. A full report of these excavations will be forthcoming in a later issue of the Review.

The Georgia Mineral Society enjoyed on June 29th a very successful trip to Graves Mountain in Lincoln county. Ten members made the trip and recovered specimens of pyrophyllite, rutile, lazulite, kyanite, limonite, and quartzite. A trip to Cherokee county to visit numerous different mineral deposits is planned in lieu of the August meeting.

Numerous requests from mineral collectors of other states for exchange of specimens are being referred to the Georgia Mineral Society. Any person interested in such exchanges is urged to get in touch with the Division of Geology.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



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No. 9

Federal Forestry Work in Georgia

**Brief Sketch of the Government's Forestry Activities in the South Given
by Joseph C. Kircher, Regional Forester, Atlanta**

On July 1, 1934, the U. S. Forest Service established Regional headquarters in Atlanta to handle its activities in 11 southern states. This was done so that the federal foresters could be in closer touch with the forestry activities of the most important forest region in the United States and the success of the first year of local administration has thoroughly justified the move. All of the activities of the U. S. Forest Service in the south head up in the Atlanta office except research, which for the same region is centered in the Forest Experiment Stations at New Orleans and Asheville.

The broad lines of activities of the Forest Service which are centered in Atlanta are:

1. The acquisition, protection and administration of the National Forests.
2. The cooperative fire control with the states under the Clarke-McNary Law.
3. The administration of CCC work on national forests and general supervision over the state and private CCC forest camps.
4. Cooperation with states and the lumber industry to get better forest practices in private timberlands.

When the forestry movement started some 40 years ago, large areas of public domain were set aside as national forests in the west, and these have been protected and developed ever since. In the east and south, however, the government no longer held any wild lands, so that it was not possible to create forests here. In 1911, however, public demand for the protection of watersheds through preservation of forest cover resulted in the passage by Congress of the Weeks Law, which allowed the federal government to purchase lands for national forests. Later, this authority was enlarged to allow purchase of lands for timber growing also. Under these laws a system of national forest is being developed in the south.

Only true forest lands are purchased and upon acquisition, a complete fire protection system is installed. At the same time

plans are laid and executed for the development of the resources of these forests. While in many of them watershed protection is the primary consideration, it is possible to secure this and still make use of the timber and other resources.

The policy of the Forest Service is to develop all of the resources under coordinated plans which provide that no resource be slighted. Thus, although in a forest the timber stands are rehabilitated and timber will be cut as it matures, the recreational possibilities are being developed also and fish and game are being protected. In this way, these areas not only will become permanent sources of timber supply based upon which permanent communities will be built up, but they are also becoming playgrounds where the public may camp and rest or hunt and fish under state laws.

In Georgia, national forest purchases are limited to the mountain sections of the northern part of the state. Here two national forests, the Cherokee and the Nantahala, are being developed. So far, somewhat less than one-half million acres have been purchased, but upon completion, the two forests will contain about one million acres of federal lands in Georgia.

Even though these areas have been largely cut over in the past, and many of these repeatedly burned, they are always supplying some wood products which are harvested by the local population. So far, cutting of timber has been largely in the nature of salvage or to better growing conditions, and it will be many years before these forests come into full production. Meanwhile, however, they have become great summer playgrounds where thousands of Georgians enjoy the beauty of the mountain scenery, the cool climate and the fishing and hunting. To make these forests of greater public use, a good road system is being developed as well as a number of camp and picnic grounds. On the shores of Lake Rabun the Forest Service will soon develop a bathing beach.

It would be unwise, of course, for the
(Continued on Page 5, Col. 1)

FIFTH ANNUAL VOCATIONAL FORESTRY CAMP HELD AT DAHLONEGA JULY 28, AUG. 3

The fifth annual vocational forestry camp was held at The North Georgia College, Dahlonega, Georgia, during the week July 28 to August 3. Previously the duration of the camp was three weeks, but due to the lack of finances could be held for only one week this year.

One hundred and six vocational students attended the camp, 63 for the first time and 43 in the second year group. Sixty counties were represented. The students were selected on the basis of a competitive examination in forestry, general scholarship and moral character also being considered.

Courses in tree identification and utilization were studied by the first year group, while the second year boys studied surveying and mensuration. Since the camp was held for only one week, the students began their studies the first day, using all the time available for classes. As a result of intensive work, six of the second year group made an average of 100 and nine made an average of 98. The honor roll for the second year group is as follows: George Brown, Carnesville; Frank Downer, Richland; James Harden, Ocilla; Hugh Lewis, Washington; Dewey Medders, Sylvester; Marion Renfroe, Quitman, all of whom made 100; Cecil Attaway, Wrightsville; Buel Carlan, Commerce; Lehman Dekle, Register; Edwin Drake, Adrian; Charley Jones, Coffee; John Miller, Franklin; Scott Walters, Gore; George Westbrook, Cadwell and Henry Williams, Plains, who made an average of 98.

The honor roll of the first year group is as follows:

William Dalton, Dacula, Ga., 98.8; Paul Barrett, Sparks, 98.1; Charlie Kiker, Jr., Epworth, 97.5; Fred Brown, Carnesville, 97.5; James Rainwater, Fairburn, 96.5; Ray Stephens, Franklin, 96; Wallace Childs, Chula, 96; Amos Ray, Dalton, 95.5; Jack Veatch, Ila, 95.5; Ellis Clarke, Leslie, 95.

The camp was in charge of Mr. Geo. I. Martin, Assistant Supervisor of Vocational Education, Tifton, Ga., and the instructors were: Geo. W. Moseley, Forester, Abraham Baldwin College, Tifton; District Forest-
(Continued on next page)

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CLAUDE E. BOGGS, EDITOR

Forestry Division

B. M. Lufburrow, State Forester
and Secretary of Commission.....Atlanta
Claude E. Boggs, Educational Mgr. Atlanta
H. M. Sebring, Asst. State Forester, Atlanta
T. P. Hursey, Dist. Forester.....Rome
W. D. Young, Dist. Forester.....Gainesville
S. L. McCrary, Dist. Forester.....Augusta
W. G. Wallace, District Forester.....Columbus
Jack Thurmond, Dist. Forester.....Savannah
R. D. Franklin, Dist. Forester.....Waycross
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.....Atlanta
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ers W. D. Young, Gainesville; W. Gordon Wallace, Columbus; Stewart L. McCrary, Augusta; Claude E. Boggs, Educational Manager, Georgia Forest Service, Atlanta; they were assisted by the following vocational teachers: W. J. Culberson, W. A. Maddox, J. A. Ariail, J. G. Hatcher, W. R. Moseley, C. F. Richards, C. P. Hamilton, C. A. Nix.

Although the work was speeded up all possible, yet the teachers did not forget that "all work and no play makes Jack a dull boy", so each afternoon a halt was called in the studies and competitive games of baseball were held on the athletic field beginning at 4:30, between the first year group on one side and the second year group on the other.

At eight o'clock each evening there was general assembly in the auditorium of the college for motion pictures and a prepared program. The state forester, the state geologist, the dean of the State College of Agriculture, the State Supervisor of Agricultural Education, the Head of the Forest School at Athens, the president of The North Georgia College at Dahlonega, and several members of the college staff, appeared on the programs in the evenings.

The entire student body was taken on a tour across Woody's Gap, through the national forest and other points of interest in the Blue Ridge mountains. At the gap there is a fire tower on top of the mountain which gives a panoramic view of the surrounding country, the valley at the foot of the mountain and the Blue Ridge chain of mountains extending for miles as far as the eye can reach. The climbing of this tower was a feat accomplished by almost every student and teacher.

The state geologist gave the second year

group an illustrated lecture on the minerals, metals and clays to be found in Georgia, and conducted the entire student body to a now disused mica mine, where samples of mica were secured.

At the final assembly, held on Friday evening, August 2, State Forester B. M. Lufburrow delivered a prize of \$75 offered annually by the Georgia Forestry Association for the best work in forestry done by a vocational teacher, to Claude E. Boggs, who had been principal and vocational teacher at Dawsonville High School for four years, and previous to that had been at Gore High School in the same capacity. This prize has been designated the Herty Prize in honor of Dr. Chas. H. Herty.

The camp singing was conducted by Mrs. Boggs, and the camp secretaries were Miss Elsie Edwards of Sylvester and Mrs. Nellie Edwards of Atlanta.

Development and the Department of Vocational Education, for the express purpose of furthering our study of forestry in a more intensive way, which it is not possible to do in the classroom; desire to express our appreciation for this camp; therefore,

BE IT RESOLVED: That we, the students attending the fifth Vocational Forestry Camp, held at the North Georgia College in Dahlonega, do hereby express our deep appreciation of the opportunities afforded us for the study of forestry in the camp, and respectfully request the continuation of this camp, believing that it is a means of stimulating interest in forestry in general and in preserving and properly utilizing the forest resources of our great state; and

BE IT RESOLVED: That we express our appreciation to the North Georgia Col-



Top—First Year Students attending Vocational Forestry Camp.
Bottom—Second Year Group.

STUDENT BODY PASSES RESOLUTIONS

The students attending the vocational forestry camp held at Dahlonega for the week July 28 to August 3, in appreciation of the privilege of attending camp, and to those whose interest and enthusiasm made the camp possible, through their committee passed the following resolutions, which were read and unanimously adopted at the closing session on Friday night:

WHEREAS, we the vocational agricultural students of the State of Georgia, who have been privileged to attend a summer camp known as the Vocational Forestry Camp, this camp conducted jointly by the Department of Forestry and Geological

lege in Dahlonega, for the use of the college buildings and grounds for the camp and for the splendid cooperation shown in every way, particularly in furnishing equipment for our athletic activities, for the cordial and friendly spirit of hospitality extended both the instructors and students, and their ever ready willingness to be of service to us; and

BE IT ALSO RESOLVED: That we thank the State Department of Vocational Education for their part in making it possible to attend this camp.

Respectfully submitted:

FRANKLIN PERKINS, Alpharetta

H. A. McKIBBEN, Pavo

GEORGE BROWN, Carnesville

—Committee.

CCC ENROLEES TO PLANT CARPET GRASS SEED

Seed to be Planted on Firebreaks Constructed by Timber Protec- tive Organizations and Landown- ers

According to a recent ruling by F. A. Silcox, Chief Forester of the U. S. Forest Service, CCC enrollees may be used in planting carpet grass seed on all primary and secondary firebreaks constructed by the CCC boys, and on the secondary firebreaks constructed by timber protective organizations and land owners.

The state forester advises that land owners located in the areas to be planted will be required to furnish the seed and all necessary equipment to do the planting. The labor will be furnished by ECW.

It has been suggested that the TPO secretaries contact the members of their organizations, determine the amount of seed that will be required for each land owner and these orders can be pooled, in order to secure a better price. It is important that these arrangements be made as quickly as possible; otherwise, seed dealers will not have a supply equal to the demand and prices would probably be advanced.

In the case of TPOs that have no CCC work, orders may be taken for seed and the planting done by the individual land owners.

This offers a great opportunity to reduce the fire hazard in the forests of the state, and would be a definite step forward in the efforts of the Department of Forestry to prevent and control forest fires.

The CCC camps have constructed 5,374.5 miles of new firebreaks in the state 20 to 25 feet in width, and private land owners themselves have added 20,000 miles of firebreaks on the protected areas in south Georgia. If these areas could be planted to carpet grass, it would save considerable firebreak maintenance and would also be of value to the cattlemen by offering additional pasturage for almost year round grazing.

Such an opportunity for a coordinated land use program should prove attractive to every land owner because growing timber and grazing can, under this program, go hand in hand.

CAMP NOTES

It is told of one teacher from south Georgia, that he drove so slowly around some of the curves when he arrived in north Georgia, his car stalled and the boys jumped out and had to hold the car back to keep it from running away down hill.

On Wednesday afternoon the first year group elected officers to serve for two years. Ellis Clarke, Union High School, Leslie, was elected president, and Edward Stone, Palmer-Stone Consolidated, Oxford, vice president.

SCHOOLS DOING BEST WORK IN FORESTRY, YEAR 1934-35

Dawsonville High School Awarded Herty Prize by Georgia Forestry Association

Each year the Georgia Forestry Association awards a prize to the vocational agricultural teacher doing the best work in forestry. For the school year of 1934-35 this prize went to Claude E. Boggs at the Dawsonville High Schol. This school is located in the second district of which W. D. Young, Gainesville, is district forester.

Mr Boggs and his students carried out as far as possible the management plans laid out by the Georgia Forest Service for conducting the school project.



Display of specimens of woods collected by
Dawsonville Forestry students

Each student studying forestry was required to have a home project in forestry, using for the project two or more acres of woodland. Protection, thinning, pruning and planting where necessary, were carried on by the student. A plan of work was followed for each project covering a season, this being part of the student's regular instruction in forestry.

The enterprise that created the most interest, among the students and in the community as a whole, was the collecting of 69 sections of different woods found in the community and arranging these in an attractive display.

Tree seed were collected by the students and five tree seed beds established for growing seedlings with which to plant school property.

A circular demonstration to show the correct spacing of pines was established. The rows of planted seedlings, radiating from a center widen, and this provides a great range of spacing to give information as to which spacing is best to use in the region.

Unusual interest was shown in this demonstration, not only by students, but by people in the community.

General interest was also created in forest fire prevention through student effort, principally as the result of posting fire prevention signs in conspicuous places throughout the community.

On the school forest the principal activity was in thinning and pruning trees, a work that was also extended to adjoining forests.

In the first forestry district of the state, composed of 20 counties in northwest Georgia, with T. P. Hursey as district forester at Rome, the teacher reported as doing the best work in forestry for the school year 1934-35, is R. L. Johnson, Fairburn. Prof. Johnson not only did good work in promoting forestry in his school and community last year, but has carried on a good forestry program for the past two years. A great deal of interest has been created in forestry by the work that has been done in the school room and by students on their home projects.

There were 62 forestry students, each of whom had a home project on which he practiced pruning, thinning, constructed firebreaks and did some planting.

A school project was started on which 2,000 loblolly, 1,000 longleaf and 500 slash pines were planted. A seed bed was established in which black locust seed were planted. The pupils gathered several pounds of loblolly pine seed some of which were planted and the rest sold. In addition to forest practices on their own school forest, these students included other areas nearby where practical demonstrations were carried on.

In the forestry district where S. L. McCrary is district forester, with headquarters at Augusta, the best work in forestry was done by schools at Stapleton and Wrens. This forest project is conducted jointly by the two schools, with Prof. J. K. Callahan in charge of both. Mr. Callahan is to be congratulated on the splendid program carried on with these schools, which not only created a great deal of interest among the students themselves, but throughout the entire county. Both schools had 55 boys in the forestry work.

An outstanding piece of work revealing a high degree of initiative on the part of Mr. Callahan is the organizing of a timber and game protective association in his school district, which includes almost the upper half of the county. He hopes to make this organization county-wide in a short time.

The students have spent one double period per month studying forestry; they collected and sold pine seed and planted 400 seedlings.

(Continued on next page)

Hogansville High School, Hogansville, Ga. is reported as the school in the fourth forestry district doing the most outstanding work in forestry during the period mentioned. Mr. C. A. Bray is the vocational teacher and W. Gordon Wallace is district forester with headquarters at Columbus. This school ranked third in the state for doing the best forestry work.

Twenty-five pounds of pine seed were collected, ten dollars worth sold and the remainder planted. This included: loblolly pine, longleaf pine and dogwood. The Hogansville Nurseries purchased five pounds of loblolly seed and have planted a seed bed of them as an experimental project.

Young dogwood and redbud trees were transplanted from the woods to the school grounds.

Fruits from all the different species of trees in this community were collected and an exhibit made by the students. They also collected, cured, mounted and exhibited leaves from all species of trees.

The Hogansville Kiwanis Club, with 45 members, sponsored a special forestry program. One of the forestry students from Hogansville High School made a talk on the value of forestry in Georgia and how we can best protect our forests, and displayed the leaf, seed and fruit exhibit, each species of which was carefully labeled. Samples of different woods were shown and pictures obtained from the federal forest service.

Plans are being perfected for the erection during the summer of a log cabin on the school forest, for special meetings and social activities. The boys also built a fish pond near the school.

As further evidence of the interest of the Kiwanis Club, an essay contest was held, and a number of articles were written for the LaGrange Daily News.

This school has established a school forestry library, and a number of books, bulletins and pamphlets on this subject have been secured.

Shad Calloway, a graduate of Hogansville High School, a forestry student and winner of vocational forestry certificate, now an FERA teacher, continues his interest in forestry by giving special lectures to farmers and others in the county who may be interested on forestry practices, and the prevention of soil erosion by means of proper terracing and reforestation.

In the district in which Jack Thurmond is district forester, with headquarters at Savannah, Vidalia and Center Schools, F. D. Garrard, teacher of vocational agriculture ranks first as regards work done, and Soperton High School, N. J. Deal, vo-ag teacher, is second.

Twenty-seven students were in the class under Mr. Garrard. Seed were collected and seed beds established by the students. Mr. Garrard called the farmers of the community together for the discussion of forestry problems and definite plans were made for

carrying forward this program throughout the entire section.

Articles for the county paper were prepared by the students, and an educational trip to the pulp and paper plant at Savannah was made during the school term.

At Soperton, 18 students in forestry gathered tree seed, established seed beds and transplanted 100 seedlings on the school forest. The management plans prescribed by the Georgia Forest Service were carried out, and in addition the boys have a cabin where they meet and discuss their work and enjoy social activities.

In the seventh forestry district of the state where Russell Franklin is district forester in charge at Waycross, the school to rank first in forestry work is Screven High School, with H. B. Franklin as teacher of vocational agriculture. Twenty-five students in the school took the forestry work. They carried out the management plans as furnished by the Georgia Forest Service, which included the gathering of tree seed and establishing seed beds.

A vigorous campaign was conducted in fire prevention, and special demonstrations in thinning were held which created considerable interest through the community.

A father and son banquet was sponsored by the students, and Dr. Allen from the Pulp and Paper Laboratory at Savannah gave an interesting talk on the experiments that are being carried on with pines as a source of pulp and paper. The forestry students and some representative citizens of the county made a trip to Savannah to

visit the laboratory, afterwards visiting the school at Soperton.

The forestry students as a special forest project, have planted a belt of pines on one side of the school forest to act as a screen and to demonstrate the growth of seedlings over a period of years.

Pavo High School at Pavo, J. D. Davis, teacher of vocational agriculture, not only ranked first in the district where H. D. Story, Jr. is district forester at Albany, but is one of the three schools in the state doing the most outstanding work in forestry. A total of 425 pupil hours were spent in studying the subject of forestry.

Forty-one students collected pine seed; of this number twenty planted seed beds as part of their home work in forestry. A total of 500 square feet of space was planted by these students, in their home projects, and four seed beds 4 x 40 feet were constructed on the school forest. A total of 1,000 seedlings were planted by the students.

A fire survey was made covering 6,510 acres, getting the amount burned, the per cent killed and the cause of each fire. The firebreak around the school forest was rebuilt.

Of the special work carried on by the students, probably the most notable was the printing of a special edition of the county paper. This was an issue devoted to forestry and the paper was made at the laboratory in Savannah from pines grown in Thomas county.

The forestry students in this school are required to identify forty species of trees and know their botanical names.

Working in The Forestry Project



The above picture shows a group of the Pavo Forestry Students working in the Forestry Demonstration Plot.

FEDERAL FORESTRY WORK IN GEORGIA

(Continued from first page)

federal government to attempt to purchase all of the forest land in the south to rehabilitate it. The greater part of it must remain in private ownership, and the owners must be encouraged to protect their lands against fire and to keep them productive. The leadership in getting better forest practice on private lands has been taken cooperatively by the State Forestry Departments and the U. S. Forest Service. Thus, while the states have most of the direct contacts with private owners, and supervise the fire control activities, the U. S. Forest Service assists the states with advice and with funds.

In Georgia, this arrangement has been very successful. Under it State Forester B. M. Lufburrow has built up a number of strong timber protective organizations, which are now controlling fires on five million acres of private forest lands. As additional state and federal funds become available, the system should be extended so that ultimately it will cover the entire state.

Much credit for the extension of fire control must also be given to the Georgia Forestry Association, a group of public spirited citizens, who, through their support of the forestry movement in the state, have done much to better conditions. The far-sighted policy of this association has certainly made the task of state and federal forestry officials an easier one.

Two and a half years ago, the CCC movement was injected into the forestry situation. Aside from the building of young men into good citizens, the impetus which the CCC boys have given forestry is beyond measure. Surely forest protection and timber production are years ahead of what they would have been without the Civilian Conservation Corps. While the Labor Department enrolls the men and the Army houses and feeds them, the supervision of the work falls largely to the U. S. Forest Service. Some other agencies, such as the Soil Conservation Service and the National Park Service work men from a large number of camps, but the majority are supervised by the Forest Service. In the southern region, the work of 322 camps, each of 200 men, is under the supervision of the Regional office. Of these camps, 128 are directly handled by state foresters on state and private forest lands.

The camp set-up in Georgia, under the supervision of the Forest Service, consists of 12 camps on the national forests, 19 camps on private lands, the latter directly handled by the state forester. These camps have done a tremendous amount of work in putting forests into better shape. They have constructed hundreds of miles of fire control roads, as well as telephone lines, fire lines, lookout towers and other improvements. They have improved the timber stands, built recreational improvements and fought forest fires. In fact, these boys are

doing most of the development work in the forests, and their labors will have far-reaching beneficial results.

The other line of activity of the U. S. Forest Service mentioned is cooperating with the states and the lumber industry in getting better woods practice. This is quite new and started last year with the development of the conservation provisions of the lumber code. In spite of the cancellation of the code, the Forest Service is now organizing this service to the lumber industry in order to advise it as to better woods practice and how to keep timber lands productive. Quite naturally, the government cannot make detailed management plans for private timberlands. This is a job for private and consulting foresters.

It can, however, advise lumberland owners and operators how to modify their practices to keep their lands productive, and it can give leadership in cooperation with the states in getting better woods practices; and this is what it plans to do.

This, then, gives a brief sketch of the government's forestry activities in the south. Lack of space prevents more details, but it must be added that the Forest Service has localized its administration in order that it may have a better understanding of local conditions, and so that it may be of highest public service. The local forest officers are public spirited; they believe in their communities and they want to help them put their timber resources to the best and highest use. The whole organization is here to assist the people of the State of Georgia, and other neighboring states, in bringing to full production their wonderful timber resources.

JOSEPH C. KIRCHER
Regional Forester

FIRST DISTRICT

T. P. Hursey, Dist. Forester
Rome

Cherokee County T. P. O.

After a short-lived slump, the Cherokee county T. P. O. has returned to its former state of activity. A secretary-patrolman has been employed, and in order to adequately cover the entire protected area, they expect to have another patrolman in the near future.

The county grand jury, at their regular meeting, recommended that the county commissioners pay \$500 per year to the TPO, in order to make it county-wide.

This TPO was organized about the first of July this year, and is to be commended for its good work.

Lookout Mountain T. P. O.

The Lookout Mountain TPO has had setbacks from time to time, due to various reasons, but a plan is now on foot which it

is hoped will develop this TPO into one of the best in the district. They expect to employ a secretary-patrolman in the early part of September.

Martha Berry T. P. O.

At this time the Berry School property is all the land covered by this TPO. However, plans are being worked out to broaden the scope of this organization. As land is purchased for addition to the school property, it is put under fire protection. This is an ideal forest; fires are kept down to a minimum and natural reproduction is abundant. A private nursery is operated, and the seedlings raised are planted wherever it is impossible to have natural reproduction.

Camp P-87, located on the end of the property, has been at work for about a month constructing trails through the property.

Camp P-86, Menlo, Ga.

Camp P-86 is located in an abandoned field on the top of Lookout Mountain. It will have as its job the preparation of forest property belonging to members of the Lookout Mountain TPO, so that this property can be protected permanently from devastating fires which have slowed the timber growth in this country in past years.

During the short time that this camp has been working, many signs of improvement can already be seen. Patrolman O. C. Greene is very helpful. In addition to his regular duties as patrolman, he relays messages for the camp, points out TPO property to surveyors, and helps the camp superintendent get permits where necessary.

The district forester spent August 20 and 21 at the 4-H Club camp held on the rifle range near Ringgold, Ga. Boys from five or six counties attended this camp and they were given special instruction in fire protection.

SECOND DISTRICT

W. D. Young, Dist. Forester,
Gainesville

Plans are being made to organize the Sandy Creek area near Athens, Georgia into a Timber Protective Organization. This area has been under the Administration of the Soil Erosion Service for the past year or so. Meetings will be held at various points over the area at an early date with prospects of signing up a total area of 105,000 acres.

Signed up acreage in the Tugalo TPO is steadily increasing, 25,000 acres having been signed up to date. This T. P. O. embraces part of Hart and Stephens and all of Franklin county. Plans are being made to extend the area and make the TPO a 3 county organization. Meetings will be held this month and next with this in view.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester
Savannah**

Liberty-Long T. P. O.—Equipment Purchased

The Board of Directors of the Liberty-Long Timber Protective Organization at their last meeting purchased a Forty Diesel tractor and Hester Plow for use in constructing and maintaining firebreaks and truck trails.

The equipment is on the ground and actual maintenance work on firebreaks constructed from ECW funds will begin on September 1st.

The T. P. O. through its manager who has charge of all T. P. O. work will supervise the maintenance of all firebreaks and construction of all new secondary breaks. Liberty-Long T. P. O. under the new management of Perry Gordon is showing new life and all phases of protective work are progressing nicely.

Ocmulgee T. P. O.

The Ocmulgee Timber Protective Organization recently purchased an A. C. tractor, Hester Plow and road machinery for use in maintaining primary firebreaks and construction of secondary firebreaks.

All primary firebreaks and truck trails will be reworked by the T. P. O. using a road machine for the maintenance work. All secondary firebreaks will be constructed with the Hester plow.

Tractor and Plow Demonstration

The Oconee T. P. O. covering lands in Treutlen, Montgomery, Laurens and Toombs counties plan to have a demonstration this week given by four tractor and plow companies to determine what equipment the T. P. O. will purchase.

Equipment purchased by the T. P. O. will be used in reworking all existing primary firebreaks and construction of secondary firebreaks.

E. C. W. Notes

Camp P-89 Swainsboro is completed and actual work in the field was started early in August. The supervisory personnel is all on hand and some good work is expected.

The original enrollees at P-82 Reidsville were recently moved back to Utah. This original company is a 2nd Corps Area Company and were moved from Utah to Reidsville but were recently moved back and P-89 Tattnall manned by a 4th Area Company.

Camp P-63, McRae, has moved to their new camp site and the old camp which they used has been turned over to the Park Service along with the Veteran enrollees. The new camp is manned by juniors.

DR. AUSTIN CARY RETIRES FROM ACTIVE SERVICE

Was Authority on Scientific Forest Practices — Valuable Service Rendered National and State Forest Services Alike

With almost a half century of active work in the forestry profession behind him, Dr. Austin Cary, whose latest title was Senior Logging Engineer, retired from the U. S. Forest Service on July 31st.

Beginning when forestry was a new and untried profession, with keen foresight, good judgment and hard work, Dr. Cary has just laid aside his profession for a well earned rest. However, it is felt by those in close touch with Dr. Cary that his career is by no means ended and that his advice and experience will be sought frequently by those who need guidance in the fields of forestry practice where he is an unquestioned authority.

His work in recent years has been centered in the northeast and south, where he has worked intimately and untiringly with hundreds of land owners on management plans for their turpentine forests, and on other phases of forestry work. His intimate

contacts with the land owners and farmers particularly in south Georgia, where he has known their forestry problems, has been their personal friend, calling them by their given names and has worked side by side with them in their forests, has endeared him to them personally and has borne much fruit throughout the years.

To quote from the U. S. Forest Service Bulletin, from an article by A. B. Hastings, on the retirement of Dr. Cary, "His keen grasp of practical forestry, unfailing good sense, modesty and determination have perhaps been at the root of his almost universal success in dealing with forest land owners."

Chief Forester F. A. Silcox of the U. S. Forest Service expresses sincere regret at the retirement of Dr. Cary from active service, and at the same time congratulates him on what he has meant to the cause of forestry in the United States.

Dr. Cary secured his A. B. degree at Bowdoin in 1887, and in 1890 his A. M. degree. He studied biology at Johns Hopkins and Princeton and later taught in the Department of Geology and Biology at Bowdoin. From 1905 to 1909 he was assistant professor of forestry at Harvard.

He served the State of New York as Superintendent of State Forests for the years 1909 and 1910, and previous to that time had been employed by the Forestry Commission of Maine.

In 1905 the U. S. Forest Service employed him as forestry expert, but his continuous service did not begin until 1910.

Although in the employ of the Forest Service of the government, Dr. Cary was always ready and anxious to give the state foresters the benefit of his experience, whenever this was sought.

For many years Dr. Cary was a contributor to technical and trade journals and his "Manual for Northern Woodsmen" has been in such demand that it has been printed in several editions.

Wishes for many happy, useful years to come are expressed for Dr. Cary by those with whom he has been associated, and by those whom he has served so unselfishly.

DIVISION OF FORESTRY TRANSFERS STAFF MEMBERS

On August first, Russell D. Franklin who had served as district forester at Rome for fifteen months, was transferred to Waycross, succeeding C. B. Beale who had previously resigned to accept a position as forestry expert in soil erosion work.

T. P. Hursey has been appointed to succeed Mr. Franklin, and his headquarter will be at Rome. Mr. Hursey graduated from the University of Georgia in 1933 and has completed one year's work toward his master's degree, specializing in the nursery work. He taught school for one year in Brantley county and was in CC camp work for several months at Hinesville and Soperton.



DR. AUSTIN CARY
(Photo through courtesy
W. R. Mattoon, Extension Forester
U. S. Forest Service)

Soil Erosion and Land Planning in Georgia

Geoffrey W. Crickmay

The ever-changing nature of the earth's surface has previously been emphasized in these articles, but in no other connection is this instability more plainly and painfully evident than in the erosion of the Southern soils. In Georgia, unrestricted soil erosion is rapidly changing arable fields into barren gullies and fertile land into sub-marginal land. Every rain storm is a mordant, etching a picture of wastage, and every red river and red stream is a tragedy of lost ground. Such soil wastage was directly responsible for economic collapse in Central America (Mayan culture), Asia Minor, and China. Is Georgia to follow the same path? Is Georgia to become a sub-marginal state?

The situation has become so acute that the Federal Bureau of Soil Conservation has established a number of demonstration projects in the state where the most practical methods of saving the soil are applied. Soil erosion control is not an emergency measure for reemployment during the depression but is the crux of a permanent plan of land conservation whose need was felt with the plowing of the first terrace and which is now demanded for the future welfare of all agricultural states. Ultimately an adequate land use program, based on the results obtained in the demonstration areas, must be applied to every acre of erosive land in Georgia. The problems involved are far too complex to be treated fully in these pages. This article is a brief sketch of the factors involved, the types of erosion and methods of control, the physical and social significance, and future work to be done.

Erosion is a natural geological process consisting of the wearing down of the land by rainwash and excavation, by streams (wind erosion, important in the western states, is an inconsiderable factor in Georgia). Amicolola Falls, Tallulah Gorge, and Stone Mountain are all the result of normal wearing away of the land over a long period of time. Our landscape, the natural contour of the land, represents an equilibrium between the process of tearing down and building up, a balance between erosion and soil formation. Under a *natural* environment soils develop faster than they are eroded and there results fertile and arable land, but under the *artificial* conditions imposed by man erosion may easily get the upper hand with devastating results. The area surrounding Ducktown, Tennessee is an instructive if terrible example of what happens when erosion exceeds soil formation, a barren wilderness of bare gullied hills upon which little that is green survives. Exactly similar wastage is taking place all over Georgia. Every plot of bare ground is a focal point for infection from the disease of soil erosion. The reduction of yields in spite of

increased fertilizer bills, the degradation of old plantations, the evils of share cropping are all symptoms of the same affliction.

The nice balance between these two processes of erosion and soil formation is dependent on four factors: Climate; Degree of slope; Soil type; Vegetative cover. Disturb one of these factors by smelter fumes, forest fires, lumbering, or agricultural development and the balance is disturbed, always in the direction of increased erosion.

Climate is a many-sided but somewhat constant factor. Its most important phase is rainfall which in Georgia ranges from an average of 44.25 to 70.48 inches a year, and from a minimum of 22.00 inches to a maximum of 101.67 inches a year. Rain falling on the ground may follow any one of four courses. It may be evaporated and return

to the air; it may be taken up in the transpiration of plants and thus also return to the air; it may seep into the ground and become ground water; or it may run off on the surface. The surface run off is responsible for practically all soil erosion in the state and conservation measures are primarily concerned with its control. Because summer rains fall in sudden beating thunder showers there is very little chance for water to enter the ground and run off is consequently at a maximum. It is at this time of the year that the destruction of the "red hills of Georgia" becomes evident in the deeper red color of the creeks and rivers.

The transporting power of running water is dependent on velocity which in turn is dependent on slope. Fast flowing streams can carry much more sediment than sluggish streams, and the wash off from steep slopes is much greater than from shallow slopes. The critical angle of slope above



GULLY EROSION IN STEWART COUNTY, GEORGIA

This gully has swallowed up a barn, a church, a school house, a graveyard, several farms and farm houses.

which clean cultivation will bring disastrous results varies with the type of soil. Instances of erosion on almost horizontal land are on record but generally slopes up to 7% and rarely as high as 12% are tillable. Slopes greater than 12% should never be cultivated.

The soils of Georgia will be discussed in a later article but some general remarks are appropriate here. Most of the soils of the state are residual, that is, they have been formed from the underlying materials which range from the incoherent clays and sands of the Coastal Plain to massive granites and gneisses of the Piedmont area. Soils, however, are not simply weathered rock but result from a long-continued soil-forming process which builds up a definite soil profile consisting of three layers or horizons which for convenience are labeled A, B, and C, which respectively are the topsoil, subsoil, and the underlying, partly decomposed bed-rock. Fertility decreases from horizon A down to C but erodibility, the ease with which run off will carry away soil particles and plant food, increases rapidly in this direction. These relations apply everywhere and are of immense significance, for it is apparent that erosion and decrease in fertility go hand in hand and that the destruction of the soil is a constantly accelerating process. For instance, according to H. H. Bennett, Director of the Soil Conservation Service, certain Piedmont areas require 400 to 600 pounds of fertilizer to the acre where formerly 200 to 250 pounds were sufficient.

The U. S. Bureau of Soils has mapped a great many different kinds of soils in the state. Each soil type reacts to erosion in its own peculiar way. As a general rule deep sandy soils do not wash as severely as those having impervious clay subsoil, for a highly absorptive texture permits rainfall to seep directly into the ground. For example, the relatively steep slopes of Pine Mountain, Meriwether County, upon which peaches are extensively grown, exhibit very little erosion because of the well-drained and open-textured soil; but to the north, near Greenville, large areas of shallow sloping land of Cecil clay loam have been entirely lost to further cultivation by the encroachment of deep gullies. It is apparent, therefore, that modern soil maps are a necessary preliminary to a full program of land use involving crop adaptation and soil conservation.

The main function of a vegetative cover is a deterrent to exclusive run off but also the binding effort of grasses, tree roots, and forest litter help to hold the soil in place. It is here that man enters to upset completely the nice balance of nature. The killing of all vegetation by deadly sulphur fumes at Ducktown brought about the excessive soil erosion in that area. The removal of the natural cover in Georgia for the growing of cleanly cultivated crops such as corn, cotton, and tobacco is the main cause for soil erosion in the state.

Control measures attempt to set up an artificial balance by returning part of the land to its native cover, by judicious planting of crops, and by constructing terraces, check dams, and other structures to prevent or at least hinder rapid run off.

There are two main types of soil erosion, gully and sheet erosion. The former is familiar to everyone, although all do not realize the speed with which gullies encroach upon valuable farm land. The prodigious gullies of Stewart County, representing thousands of acres of ground forever lost for further cultivation, started less than 75 years ago. One of the largest of these gullies, locally called Providence Cave, was initiated by rain drip from a barn roof and has since swallowed not only the barn which gave it birth but also a church, a school house, a graveyard, several farms and farm houses. Gullies grow by sapping at the head in such a way as to maintain nearly vertical walls as they eat their way back. They are lost ground and therefore is a tendency for the farmer to disregard them. They were disregarded in Stewart County and in consequence the improved farm acreage has shrunk to about one-third of the 1850 figure and crop yields have dropped from well above to below the state average. It is absolutely essential that gullies be stabilized or controlled by water diversion, the erection of checkdams, and the planting of vines, small trees, grasses and other thick-growing plants.

Sheet erosion, as the name suggests, consists of the removal of soil in sheets, the depletion of the A horizon by erosion at about the same rate over an entire field. The most insidious thing about this type of erosion is that it most frequently quite escapes the inexperienced eye until the B horizon or even the C horizon is laid bare as infertile scars. The Soil Conservation Service estimates that whereas 35 million acres of land in the United States have been ruined by gullies, at least 125 million acres have been critically reduced in fertility by sheet erosion. Ridge terraces were designed to prevent this loss but in a great many instances uncontrolled spillways promoted the growth of gullies and the cure merely led to a greater evil. Soil experts are now generally agreed that sheet erosion can be stopped only by terracing with the broad base or Mangum terrace, by contour farming, and by the removal from civilization of all steep sloping land. The growing of close-growing crops such as grasses, small grains, and legumes in contour strips or bands alternately with the regular cleanly cultivated crop, called strip cropping, has somewhat the same effect as terracing but is commonly practiced in conjunction with terraces. The best remedies for any particular farm are dependent to a large extent on local conditions. In the Sandy Creek demonstration area at Athens, under the direction of Loy E. Rast, every plot of land has been classified according to type of soil, slope, extent and type of erosion, and

land use so that the best possible control measures may be applied with the least inconvenience to the farmer's own schedule.

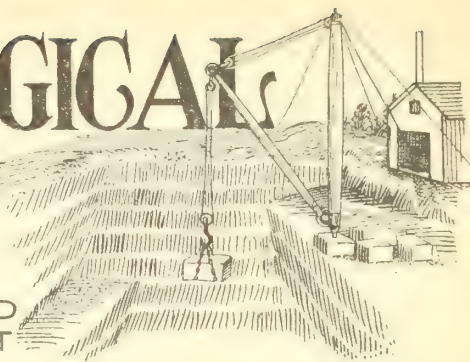
Soil erosion is by no means entirely the farmer's problem. Consider briefly some of its far reaching effects. Unchecked run off means depletion of ground water supply upon which most rural homes and towns are dependent. It means increased flow in stream channels, even to the proportion of devastating floods. Great additions of sediment to drainage channels mean muddy streams, excessive filtration of city water supply, and poor sport for the fisherman. It means the silting of hydro-electric reservoirs and of navigation channels with consequent necessity for costly dredging. The rapid removal of natural cover means the loss of food for our game birds. No less directly soil erosion means the decline of all industrial development in the state that is dependent on agriculture. Land loss is a direct loss to the state; it consists literally of throwing capital into the ocean. And of even greater consequence is its social significance. F. A. Silcox, Chief, U. S. Forest Service, has recently said, "Deforestation (which inevitably leads to soil devastation) gnaws at the social and economic vitals of the social fabric." Sub-marginal land means sub-marginal people.

Up to the present time, the Federal government has assumed the entire burden of soil conservation by establishing demonstration areas at a number of strategic points. These projects are only demonstrations of what can be done. It is very essential that this work be extended by placing in each county at least one man to whom farmers may appeal for help. Farmers have been condemned as "too lazy or too careless" to prevent soil erosion. It is not a case of laziness or carelessness but rather one of showing what should be done and how it should be done. Intelligent owners of large acreage have in the past been just as remiss in this respect as their tenants, even though the responsibility should fall on their shoulders. Those who refuse to see the necessity of fighting this erosion menace may be urged into cooperation through their mortgages, particularly those of the Federal Land Bank, which should undoubtedly include land conservation clauses if only to preserve the value of security.

A final word should be said of erosion along the state highway system. Road cuts and fills present steep bare slopes that are invariably attacked by rainwash, starting gullies which eat back both into the road and bed and adjoining fields. Mr. Hubert Owens has recently been appointed Landscape Architect to the State Highway Board. His work will involve not only beautification of roads but the protection of fresh cuts from erosion by the planting of shrubs, vines, and grasses. For effective progress to be made in this important phase of soil erosion control, cooperation from county organizations is essential.

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B. M. LUFBURROW COMPLETES TEN YEARS AS GEORGIA'S ONLY STATE FORESTER

Progressiveness the Keynote Of His Administration.

At a meeting of the State Board of Forestry on September 25, 1925, the Department of Forestry was organized and an executive committee appointed, in accordance with an Act of the Georgia Legislature, approved in August of that year.

At a second meeting of the State Board of Forestry on October 15, 1925, Burley Matthew Lufburrow, a native of Screven county, Georgia, and graduate of the Forestry School at Athens, was selected to serve as state forester.

In the ten years of his incumbency, Georgia's forestry program has been one of steady progress. The system of forest fire protection built up in Georgia has attracted nation-wide attention, has received recognition and approval of the federal government, and has assured the Georgia timberland owner of financial assistance in protecting his forests from fire.

The executive ability, the conservative management of the department, and at the same time the progressiveness of Georgia's first and only state forester have accomplished for Georgia phenomenal results in the forestry field, far more than has been achieved by any other state in the same period of time.

Mr. Lufburrow has served as secretary to the Georgia Commission of Forestry and Geological Development since the death of State Geologist S. W. McCallie.

Expressions of appreciation for Mr. Lufburrow's efficient and untiring work for the cause of forestry in Georgia have been received from some of his friends who remembered that October 15 marks the ten year period in his administration as state forester.

The following telegram was received:
"Congratulations upon ten years of excellent forestry management for the State of Georgia and administration of your office in a manner which has won the respect and admiration of foresters in all parts of the country. It has been a pleasure to have

known you and your work for many years and to have cooperated with you in furthering the best interests of forestry."—Charles Lathrop Pack, President American Tree Association, Lakewood, N. J.

"You have done a good job in Georgia. I do not know any state in the South that is more forestry minded, or one in which as many people have undertaken to practice forestry on a large industrial basis. While good forest growing conditions and comparatively low forest taxes have undoubtedly played a part in bringing about this favorable forestry attitude, I know



B. M. LUFBURROW,
Georgia's first and only State Forester

that you and your organization can justly claim a great deal of the credit for what has been accomplished. I congratulate you and hope to see you continue to successfully develop the forestry interests of your great state."—I F. Eldredge, Regional Survey Director, U. S. Dept. of Agriculture, New Orleans.

(Continued on Page 2)

LAND USE AND MILITARY RESERVATIONS

By Geo. Van Horn Moseley
Major General, U. S. Army

Modern principles of land use are being practiced by the United States Army in a constructive conservation program now well under way on five military reservations located in the South.

The most extensive projects are being undertaken at Fort Benning in Georgia and Fort Bragg in North Carolina. The other military reservations included in the experiment are Fort McClellan, Alabama; the Waco Rifle Range, Georgia and Barksdale Field near Shreveport, Louisiana.

For many years Army officials have recognized the conservation potentialities of the timbered tracts which comprise large portions of the War Department's military reservations throughout the country, and in some instances have made attempts to practice scientific forestry in connection with their administration. Lack of adequate appropriations and co-ordinated administrative machinery for carrying out such a program in connection with the dominant military purpose of the reservation have doubtless been responsible for the abandonment of these efforts in the past.

As is well known, the Army has been closely allied with the development of the Civilian Conservation Corps since the former was selected by the President to be responsible for the housing, feeding, and general physical welfare of the Civilian Conservation Corps lads, though their work projects were planned and supervised by other governmental agencies, notably the United States Forest Service, the Soil Conservation Service and the National Park Service. It was natural that sooner or later Army officials would recognize that the utilization of Civilian Conservation Corps labor offered a splendid opportunity for constructive improvement of military reservations from a modern land-use viewpoint, and that some definite action would be taken along this line. When the proper time came, preliminary conferences were held with forestry officials of the Southern Region of the Federal Forest Service, with whom Fourth Corps Area officers have worked in close co-operation since the inception of the Civilian Conservation Corps.

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

(Continued from Page 1)

"Even before my active connection with the Georgia Forestry Association, my attention was attracted to the outstanding work in forestry done by Mr. Lufburrow and his efficient organization. Since the work of the association has brought us in closer contact, I have been impressed with Mr. Lufburrow's fine spirit of cooperation and his earnest desire that every citizen of Georgia shall become forest minded, that every division of the organization shall work together harmoniously and undividedly for the cause of forestry, and that the greatest possible benefits shall accrue to Georgia from the successful management of her forests, including fire protection, conservation, reforestation and recreation.

"In every activity of the Georgia Forestry Association, Mr. Lufburrow has given whole hearted cooperation."—T. Guy Woolford, President, Georgia Forestry Association.

"For nearly seven years it was my privilege to be connected with the Georgia Forest Service, and to work under Mr. B. M. Lufburrow, the first and only State Forester of Georgia. The chief tribute I gladly pay him is a word of praise for his progressiveness.

"The Forest Service of Georgia has been developed along original lines and that too, with such success as to win praise of foresters throughout the country. Only lack of adequate funds has prevented Mr. Lufburrow from developing a still greater program, and achieving still greater success."—C. A. Whittle, State Administrator, ECW in Soil Conservation Service.

"To those of us who were acquainted with forestry conditions of ten years ago, and who have seen order gradually brought out of chaos through the efforts of our state forestry department, there exists a feeling of deep appreciation of the work of B. M. Lufburrow who has served as state forester since the installation of this service. Real generalship has been required to overcome the obstacles and to educate opposing minds to the benefits and desirability of forest administration. Grasping the enormous possibilities of reforestation in Georgia and working with a view to the great good which would accrue therefrom, Mr. Lufburrow has proceeded with caution but firmness, and has cleared the way for the development which has now begun and which has started our state on the way to its former forest glory.

"On his completion of ten years of real service, I congratulate Mr. Lufburrow upon his accomplishments."—Herbert L. Kayton, President, Carson Naval Stores Company, Savannah.

"The date October 15, 1925, is memorable in the history of forestry in Georgia because on that date the foundations of the Georgia Forest Service were laid by the appointment of B. M. Lufburrow as state forester. The most optimistic among the little band of pioneers in the Georgia Forestry Association could hardly have foreseen the progress in forest fire protection and forest management that has come in this state since the Georgia Forest Service was organized in 1925. What a privilege and honor it has been to lead and direct a state forestry organization during a decade marked by such striking developments.

"I feel that we are at the threshold of a period of even greater progress in making our forest lands contribute their full measure to our economic and social well being. The Georgia Forest Service is facing tremendous responsibilities and opportunities, which, I am sure will be met with vision, energy, and resourcefulness. I congratulate Mr. Lufburrow on his tenth anniversary and pledge the cooperation of the United States Forest Service in working for the greater accomplishments that lie in the future."—Joseph C. Kircher, Regional Forester, U. S. F. S., Atlanta.

"It has been my pleasure for the past six years to work in very close cooperation with Mr. B. M. Lufburrow in promoting the joint program of forestry education in our vocational schools. Through this association, I have had an excellent opportunity to learn of his great service to the forestry interests of the state. I know him

best as one who knows the real meaning of the word 'Cooperation'. I have never worked with anyone with a finer spirit of cooperation than Mr. Lufburrow."—M. D. Mobley, Asst. Director Vocational Education, Atlanta.

"October 15th marks a milestone in the history of the Georgia Forest Service. Ten years ago Mr. Lufburrow became state forester, and beginning with a meagre staff and very adverse conditions toward forestry and fire conditions, he has built up an organization and achieved results that are comparable to no other state service during the same period of years.

"Mr. Lufburrow during this ten year period, in organizing the various timber protective organizations throughout the state, has gone a long way toward making our forests immune from fire. The writer has been in the flatwoods region practically during this entire period, and has seen the changing conditions going from almost state wide burning to a condition that now exists where large areas are under total fire protection.

"At this time it is highly in order that Mr. Lufburrow be congratulated on his tireless efforts and splendid results, and we certainly hope that he will continue in the future as he has in the past."—W. M. Oettmeier, Forest Manager, Superior Pine Products Co., Fargo.

"Like the Georgia pine which he worked so diligently to protect and foster, the State Forester, Mr. Lufburrow, increases in usefulness with the passing years.

"Although the difficulty and stress of his task have made constant tapings on the resin of his strength and courage, each of the ten years has added to the stature of his service.

"As we count the rings that represent this decade in the life of the State Forester we see growth akin to that of the well known Renfro pine development.

"Looking beyond these rings into the wider circles that represent Forestry in the state during these ten years, we see the belt of growth between deepening and expanding with each passing year. The great tree of Forestry in Georgia is on its way to mammoth proportions."—Emily Woodward, Vienna, Ga.

"I have known few men in all the years of my life for whom I have a more sincere admiration and regard, and whose personal friendship I have cherished more than Mr. Lufburrow's. I also venture this statement that Georgia has had few sons who have rendered more valuable and lasting service to her than he has."—John S. Wood, Canton, Ga.

A BRIEF RESUME OF FORESTRY DEVELOPMENTS IN GEORGIA IN TEN YEARS

Georgia was the first state to inaugurate a cooperative educational program which introduced forestry into vocational agricultural schools. Under Mr. Lufburrow's leadership, a cooperative project between the State Department of Vocational Education and the Department of Forestry was begun in 1929. As a result, there is evidence of better fire control, better management of forests and a better grasp of the practical phases of forestry.

The Vocational Forestry Camp, which has been held each summer for the past five years, is a part of the educational program, and competition among the rural high school boys for the privilege of attending this camp is keen.

Two state nurseries, one at Blairsville and one at Albany, operated by the Georgia Forest Service, have produced and sold over half a million seedlings each year for the past several years.

Georgia's system of state parks is under the management of the state forester. From a small beginning of a few acres each at Indian Springs and Neel Gap (Vogel Park), the state has acquired by donation additional lands for parks at seven other points in the state, not all of which are yet open to the public.

The bulletins and leaflets of the department, several of which were written by the state forester, are in constant demand by schools and libraries for the valuable information they contain. The monthly publication, *The Forestry-Geological Review*, a departmental bulletin designed to promote the activities of timber protective organizations in Georgia, to furnish timely forestry information of interest to county agents, and to keep leaders of the state informed as to the progress of forestry, was inaugurated in 1930, and is in demand over the entire United States, in Canada, in the Philippines, and three countries in Europe.

The financial report of the State Forester at the close of business in 1925, showed total receipts for the period October 15 to December 31, were \$1,825. For the year 1934, the financial statement at the close of business December 31, showed total funds during that period \$94,309.23, indicating the growth of the department in financial responsibility.

The personnel of the department, as authorized in 1925, consisted of the state forester, a secretary-bookkeeper and a director of education, the latter serving without compensation from the state. Since that time, to the above have been added an assistant state forester, seven district foresters, the treasurer of the department who is also secretary to the state forester, and a paid educational manager.

Probably the most outstanding work of

the department is the fire protection system in which the timberland owners of Georgia, while preserving their own property from the depredations of the great enemy—fire, receive financial assistance in this undertaking. Under this system the public is gradually developing a sentiment against burning the woods, more farmers are planting their idle acres to trees, and the citizens of Georgia are slowly but surely coming to the realization that forests represent wealth.

In the reorganization of state departments, effective January 1932, the departments of Forestry and Geology were combined, and to them was added a new department of Research, for experimental work with Georgia pines. These three departments, working with natural resources of the state, while separate and distinct, are yet so coordinated as to be of mutual benefit.

The Research Division is no longer associated with the reorganized department, but functions independently, and has extended its experiments into other fields than that of making paper from pines.

To build a department from so small a beginning to the present status of the Georgia Forest Service in the short space of ten years, required foresight, a keen understanding of conditions, a clear head and firm hand, executive ability, and tenacity—a determination to carry on in the face of many obstacles.

The state forester of Georgia, possessing these necessary qualifications, has led the faltering footsteps of the infant department to full fledged development. Today the Georgia Forest Service is recognized throughout the nation for its progressiveness.

With sufficient funds to carry forward the forestry program in Georgia, as visualized by State Forester Lufburrow, the next ten years will bring about even greater development.

SOUTH HAS BUMPER CROP OF PINE CONES FOR SEED

Release From the Office of Information of the U. S. Department of Agriculture Calls Attention to Abundant Seed Crop.

The best crop of seed borne by southern pines in the last 15 years is maturing this month, according to the Forest Service, which has just released to forestry agencies in the South an estimate of the supply of cones. The Southern Forest Experiment Station based the estimate on reports gathered from Maryland to Florida and west to Texas and Oklahoma.

Important as this seed crop is for later forest planting by the Civilian Conservation Corps and other agencies, it is even more important, says the report, to foresters, lumbermen, and farmers who wish to

reproduce valuable pine forests without resort to planting. Now that this abundant seed crop is assured, it adds, a further essential step is to protect from fire the areas on which the seed falls so that the tender seedlings which will germinate during the coming winter and spring will not be destroyed.

Never before in the South has there been such a combination of adequate seed supply of southern pines and well-developed means for controlling forest fires. Cooperation by the public in preventing and controlling fires will help to turn this bumper crop of pine seed to good account in restocking lands now lying idle and unproductive.

The 134 individual reporters, who assisted in compiling data, submitted information on four species of pine in 14 different states. Many of these reporters are foresters, seed collectors, and experienced woodsmen who have been submitting such reports systematically for five years, and some of them have been observing cone crops in their particular localities for more than 20 years.—Release by Office of Information, U. S. D. A., Sept. 13.

STATISTICS SHOWING ACREAGE UNDER ORGANIZED FIRE CONTROL

The records of the Georgia Forest Service show a total of 4,227,614 acres of timberland under organized fire protection. Of this amount 46,500 acres have been added in the past thirty days. The per cent of increase in the districts, in that time is also given.

In the following table, acreage previous to September 1 is shown in one column as "old acreage".

Forestry District	District Forester	Old Acreage	Increase last 30 Days	Per Cent Increase	Total Acreage in TWO's
1	Hursey	236,535	3,500	1.5	240,025
2	Young	53,600	43,000	80	96,600
3	McCrary	33,370			33,370
4	Wallace	200,000			200,000
5	Thurmond	716,353			716,353
6	Franklin	2,147,070			2,147,070
7	Story	794,196			794,196
		4,181,114	46,500		4,227,614

It is the intention to give this information each month, to show the increase in protected timberlands in the state, in the hope of stimulating interest in fire protection among timberland owners.

TO PROTECT THE FORESTS FROM FIRE IS THE ONLY SURE WAY TO MAINTAIN A STEADY INCOME FROM THEM.

(Continued from Page 1)

As a result, a detailed program for the development of the five military reservations already mentioned, accompanied by a formal application for Civilian Conservation Corps camps to be assigned to this work during the fifth period of the Civilian Conservation Corps, was presented to Mr. Robert Fechner, Director of Emergency Conservation Work at Washington. Mr. Fechner approved sixteen work projects and work began in April of this year when the fifth period of the Civilian Conservation Corps was inaugurated.

From the inception of the proposal to manage our timbered areas along scientific lines, it was recognized that our officers would need assistance and advice from forestry experts in handling the technical aspects of this important undertaking. We, therefore, asked the aid of Mr. Kircher, Regional Forester, Forest Service, Atlanta, in making up a broad, far-sighted working plan that would accomplish our objectives according to the standards and specifications set for such work by the Federal Forest Service.

The experts of this bureau visited our reservations, made reconnaissance surveys, and placed before us their definite recommendations as to what should be done to assure the greatest benefits to the Army and to the public from our forest lands. These men are continuing to co-ordinate the actual operations of the Army in carrying out their recommendations. To tie in more definitely the advisory relationship of proper technical experts to this program, Mr. R. S. Richardson, Forestry Liaison Representative for the Fourth Corps Area, was assigned, at my request, to be my technical adviser in all forestry matters. Our success is due very largely to his outstanding ability and his tact in dealing with officials of all departments.

The largest of the reservations included in the experiment are Fort Benning, Georgia, an area of approximately one hundred thousand acres, and Fort Bragg, North Carolina, which comprises about one hundred and twenty-five thousand acres. At Fort Benning, forest management may be practiced on about seventy-five thousand acres without interfering with the dominant military use of the reservation. The virgin timber was cut away many years ago and the land used as small farms prior to its acquisition by the War Department at the time of the World War. Since then Nature has accomplished some re-stocking with varying degrees of success. Proper development of fine specimens of long-leaf and loblolly pine have been retarded by immature timber stands too dense to permit proper growth. In other areas the reproduction is so sparse as to have no commercial value or else there is no timber growth at all. Seedling stock is needed to correct this condition and Fort Benning will soon have a complete nursery for propagating

the young trees that will eventually rehabilitate its forest cover.

Fire is always a serious problem confronting the administrative officers of any timbered reservation, and it is even more menacing on a military reservation where constant use of firearms and hazards of a numerous and active population may cause large numbers of small fires. An important phase of our management program is the provision of adequate protection for preventing and controlling fires. Fire towers for quick detection of fires and a road system of sufficient extent and proper type of construction to put men and tools at any location promptly for fire-fighting purposes are included in our Fort Benning program.

Erosion, caused by the lack of proper ground cover, has eaten its destructive way into every section of the reservation. It may be seen both in the form of gullies and sheet erosion, and is especially prevalent in the area used constantly for military operations. Adequate measures are being taken to bring this land back to its original status and relieve the reservation from a soil condition that was rapidly becoming a menace.

For some time a sawmill with a capacity of twenty-five thousand feet per week has been operated, sawing logs from the better stands of timber but on a more or less haphazard basis. Now the trees for cutting are selected according to a definite silvicultural plan with due regard to the conservation of an adequate supply of timber for the future.

Firebreaks are being constructed so that each tract of one hundred and sixty acres is enclosed by them. This protective measure is important to the reservation, which may be invaded by fires from outside sources and also to our neighbors whose property might be damaged by fires spreading from the reservation.

A growing sense of public responsibility to preserve natural values by proper landscaping methods and the protection of trees, wildflowers, and game played an important part in our plans for locating roads in attractive settings and providing adequate water supplies for the reservations. It is also planned to dam numerous small streams on the reservation for game and fish conservation purposes. Doubtless some fish culture will be practiced in connection with this project.

If practical, the reservation may be stocked with quail, turkey and deer. It is believed that these social values in land use can be very easily preserved without interfering with the dominant military use of the reservation.

A program similar to the one described for Fort Benning is under way at Fort Bragg, a reservation of one hundred and twenty-five thousand acres of which about one hundred thousand acres are ideally

suited to conservation policies and practices. Unlike the Benning reservation, there is practically no mature timber on the Bragg reservation, and this fact emphasizes the need for a scientific plan of timber management so that we may obtain the maximum benefits from the area consistent with its primary military objectives.

The Barksdale Field Reservation, a gift from the City of Shreveport about four years ago, is a tract of about twenty-three thousand acres, sixty percent of which is so-called upland. This is the territory susceptible of forest management. Our objectives there are to make use of all potential timber land, to protect the soil from erosion, and to develop the fish, game and recreational possibilities of the area. An adequate fire protection system is being installed through the construction of the necessary roads to make the area accessible, and the construction of lookout towers and firebreaks. Ponds or small lakes will be created and streams improved to protect and develop fish and game.

The Fort McClellan Reservation, a tract of twenty-four thousand acres, is beautifully located in the scenic mountain country of northern Alabama. The post is almost encircled by a rugged ridge of picturesque blue mountain peaks. Here the major feature of our program at present is the construction of a road system, the major portion of which will follow the ridge with needed spur roads leading off toward the center of the reservation. Properly treated and protected, the timber on this reservation can be developed by natural processes if protected from fire.

The Waco Rifle Range, about two miles from Waco, Georgia, is a small reservation of one thousand, two hundred and seventy-five acres, completely forested with a growth of ground cover of some sort. The target range is a flat area in a thicket of willows along a stream. It is being cleared and drained, a project which will greatly increase its usefulness. Fire hazards are being eliminated, erosion corrected, and the road system improved. All useful timber areas that can be utilized without interfering with military purposes will be treated from a cultural viewpoint.

As an experiment in what may be done with public lands to aid in the administration's program of modern land use, the work on these military reservations is being fostered with much interest by Fourth Corps Area officers. The object of the plan is to realize the nearest practical approach to maximum productivity of the reservations through multiple use. The work should be of lasting benefit not only to the Army but to the adjacent populations at large, and should afford a practical example of the broad social benefits of the President's far-sighted plan of using the Nation's lands for the purposes to which they are best suited.

FIRST DISTRICT

**T. P. Hursey, Dist. Forester,
ROME**

Ellijay T. P. O.

The Ellijay Timber Protective Organization is one of the best functioning organizations in the state. Mr. H. E. Pinson, the secretary-manager, is doing a splendid piece of work.

Pickens County T. P. O.

The activities of this TPO are increasing as the fire season approaches. In a recent meeting the officials voted to combine with Dawson County TPO, in order to reduce expenses and improve fire protection. They are putting the firebreaks in excellent condition and repairing telephone lines, bringing the fire control system up to date.

Cherokee County T. P. O.

Plans to enlarge the Cherokee TPO are under way. This unit will eventually cover Cherokee, Bartow, southeastern Gordon and southwestern Pickens counties, since the timberlands in that area fall naturally into one unit.

Chief Patrolman Gibson has two assistants, who were added September 1. These assistant rangers have trees that are adapted to observation work instead of towers. These trees have ladders or spikes to facilitate climbing. In the top, the limbs are cut out in such a way as to give the ranger a good view. The district forester climbed these trees on an inspection tour in September.

This organization expects to add two more assistant rangers in the near future. Water for use in fighting fires is secured from the tank at Reinhardt College at Waleska.

Martha Berry T. P. O.

The Martha Berry T. P. O. voted at a meeting in September to expend their organization to include Floyd county, some of western Gordon and possibly the western part of Bartow county.

Miss Berry expressed her gratitude to the Georgia Forest Service for the fine work that Camp P-87 is doing on their property.

Lookout Mountain T. P. O.

The Lookout Mountain TPO employed Mr. Alverson Fisher as Secretary-Manager on September 1, and already Mr. Fisher has done good work. This organization is making considerable progress with the aid of CCC camp 86.

Camp SP-6 is doing excellent work at Fort Mountain Park under the direction of Superintendent C. M. Simmons.

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

On Monday afternoon, August 26th, a meeting was held at Monroe, Georgia, in an effort to secure more members in the Walton County TPO.

Speakers for the occasion were Mr. C. A. Whittle, of the Soil Erosion Service, Athens, Georgia; Mr. Dupre Barrett, Extension Forester, State College of Agriculture; and the District Forester of the Gainesville District. The meeting was well attended, approximately 250 people being present. It is hoped as a result of this meeting, considerable more landowners will sign up. Mr. Whittle made a very fine talk on Forestry and Soil Conservation; Mr. Barrett talked on Reforestation; and the District Forester summed up the progress of the TPO and explained regulations affecting the operation of the organization.

Considerable seedlings are still available at the North Georgia Nursery, both Black Walnut and Black Locust. Prices are \$3.50 per 1000 for both species. Inquiries should be sent to the State Forester, Atlanta, Georgia, or to the District Forester, Gainesville, Georgia.

THIRD DISTRICT

**S. L. McCrary, Dist. Forester,
Augusta**

Woodville T. P. O.

The Woodville TPO has recently had quite an increase in acreage. In fact, the growth has been so large that the organization is now county-wide. The members have decided to secure funds on an assessment basis instead of from donations, as heretofore.

A full time patrolman has been employed by this organization, and it will be his duty to contact landowners in the vicinity for the purpose of securing additional acreage for Woodville TPO.

The district forester is planning the organization of a TPO in Twiggs county at Jeffersonville. Interest is at a high pitch at present; a meeting was held on October 1 to organize and elect officers. More news regarding developments of this organization will be given next month.

E. C. W. Notes

Mr. W. R. Hine, of the Regional Office, U. S. Forest Service, recently accompanied Mr. Sebring, Asst. State Forester, on an inspection of all ECW Camps in the Savannah District.

FOURTH DISTRICT

**W. G. Wallace, District Forester,
Columbus**

Stewart County To Organize T.P.O.

Considerable interest has recently been manifested by land owners of Stewart County in organizing a TPO. Several large lumber companies are intensely interested, as are a large number of individuals.

Stewart County now has one of the Soil Conservation CCC camps and it is expected that this camp will be in position to give much assistance to a TPO in fire protection work. According to officials of the Soil Conservation Service, it is essential that the land owners organize a TPO in areas where work is done by Soil Conservation CCC camps in order to permanently protect and perpetuate the work done by the camp and land owners themselves. Forestry is a very important phase of soil conservation work. Fire protection is an absolute necessity to proper prevention of soil erosion. Fire protection and forest management also result in much higher dividends to the land owner through increased timber growth of a much higher quality.

Much of Stewart County is hilly and suited mainly to timber growing. In fact, if statistics were compiled, they would probably show that the chief source of income in the county is through the lumber and logging industry. It is vitally necessary that steps be taken to perpetuate the timber growth and place it on a sustained yield basis if Stewart County is to stabilize its lumber and logging industry. This can only be done through organized fire protection and planned forest management. The opportunity is now at hand and we look for Stewart County citizens to take advantage.

Regarding the Pine Seed Crop and Forest Fires

Georgia is being blessed this fall with a bountiful crop of pine mast, or pine seed. This is much in evidence by the large numbers of green pine cones noticed on all principal species of pines.

To those desiring to collect pine seed for personal use, or to sell, the proper time for gathering the cones in the central, or Piedmont section of Georgia is about October 15th. It can be determined when the seeds are ripe by occasionally examining a few cones to determine exact time for gathering.

The chief purpose of this article though, is to bring to your attention what an opportunity this big pine seed crop presents and how to take advantage of this opportunity which may come only once in every three to seven years. First, the bumper crop of pine seed this fall presents a real opportunity because we may not have a repetition of such a crop for several years.

Therefore, we must not be careless with this opportunity—we must be sure!

You recall the parable in the Bible regarding the sowing of the grain—how some of it fell on good soil and some on stony, barren soil. This parable may be made to fit our problem of reforestation. Fire has proven to be the greatest enemy of the forest whether it be a forest of young trees or mature trees. It is easy to observe the damage fire does to the visible forest. Fire however, does one great damage to the forest that is not readily visible. Fire burning through the woods, old fields, and idle land that is best suited to the growing of trees will practically destroy every pine seed that may have fallen there and sprouted, as well as the small seedlings.

This type of fire damage is not so evident for the very reason that the pine seed and small seedlings only two or three inches high are so inconspicuous. The damage is obvious only by the conspicuous absence or scarcity of trees on the area where continual fires have prevented natural reforestation.

It will pay the landowners of Georgia good dividends to take all possible precautions against fires by building firebreaks, joining or organizing TPO's and otherwise preparing to keep fire off land which might thereby get a good start towards natural reforestation following the fall of the pine seed crop in October and November.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester,
Savannah**

Areas in T. P. O.'s Increased

The total acreage of timber land under organized forest fire protection in the Timber Protective Organizations in the Savannah District is 716,353 acres as of September 1st, 1935.

This total acreage is covered by seven Timber Protective Organizations, which resulted after fourteen organizations were consolidated into seven.

Six of the T. P. O.'s in the Savannah District have full time T. P. O. Managers, who have charge of all forms of fire protection work and are responsible directly to the District Forester and Secretary-Treasurer of the organization.

The Timber Protective Organization, their acreages and Managers are as follows:

Canoochee River TPO, 81,586 acres, Graham Coleman, Manager, Swainsboro, Ga.

Liberty-Long TPO, 153,715 acres, Perry Gordon, Manager, Hinesville, Ga.

Ogeechee TPO, 108,179 acres, Perry Hubbard, Manager, Savannah, Ga.

Ocmulgee TPO, 135,586 acres, Eugene Thomas, Manager, McRae, Ga.

Tar City TPO, 90,344 acres, H. B. Brewton, Manager, Reidsville, Ga.

Oconee TPO, 114,943 acres, R. P. Marsh, Manager, Soperton, Ga.

Brier Creek TPO, 30,000 acres, C. B. Pfeiffer, Secretary, Sylvania, Ga.

The organizations have grown steadily during the past several years and as the landowners realize more fully what the fire protection system means to the business of growing timber for a profit, in the shortest time possible, the membership and acreage should increase even more.

Tar City T. P. O.

The Tar City Timber Protective Organization under the Management of Mr. H. P. Brewton, of Reidsville, is steadily increasing in acreage and will soon have enough land to warrant the purchase of a tractor and plow for the purpose of maintaining and constructing fire breaks.

There is one lookout tower already erected on the Tar City area and two more are planned, also enough telephone line will be constructed to adequately connect the three tower system with the existing lines. This TPO protects land in Tattnall, Western Evans and eastern Toombs Counties.

District Meeting

In the latter part of August, a meeting was held in Swainsboro, with all TPO Managers, Secretaries and Boards of Directors of the TPO's in the Savannah District in attendance.

This meeting was called in order that State Forester Lufburrow could outline to the officials of the organizations, policies and requirements that would have to be met by all TPO's during the coming fiscal year.

Approximately 40 TPO officials were present in addition to Mr. Lufburrow, State Forester, and Mr. S. L. McCrary, District Forester, at Augusta.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

TPO Items

The Coffee-Jeff Davis TPO, under the management of Mr. L. F. Morey, has recently taken over some 40,000 acres of signed-up land in Ben Hill and Irwin Counties. It is now planned to get enough acreage in Wilcox County to enable the landowners in Ben Hill, Irwin and Wilcox Counties to set up a distinct TPO and be independent of the Coffee-Jeff Davis organization.

The Appling County TPO has recently purchased a tractor and plow unit and Mr. Jean Dupuis, Secretary, states that he will start operating this unit as quickly as possible.

The Camden County TPO has recently purchased a tractor and plow unit and had been operating some two weeks prior to the "flood". Mr. Cy Baker, Acting Secretary, states that he has been building some real roads out of the old twenty and twenty-five ft. breaks put in by the camp, the county grader being used for this purpose.

All of the TPO's in this district have now purchased tractor and plow units with the exception of the Hurricane Creek TPO. This TPO now plans to purchase a unit at a very early date.

Practically all of the TPO's have fire trucks equipped with the latest fire fighting equipment, and, taken all in all, this promises to be a record fire season in regard to the reduced number and size of fires in this area due to the combined activities of the TPO's.

Mr. T. H. Browne, Chief Foreman, P-52, Homerville, reports a serious outbreak of Ips and Dendroctonus covering approximately 800 acres of an area that was damaged seriously by fire. Mr. Browne now has authority to combat this infestation and is working all available men on this to halt the activities of the beetles before it increases to such proportions that it would be hard to handle.

Camp P-70, Nahunta, with Mr. R. E. Tittle as Chief Foreman, is scheduled to remain in its present location for the 6th work period from reports received within the past few days. A side camp is planned from this camp to be placed in the Hurricane Creek TPO area.

FOREST SERVICE PERSONNEL CELEBRATES 10TH ANNIVERSARY OF B. M. LUFBURROW AS ONLY STATE FORESTER

In appreciation of Mr. Lufburrow as an official and as a man, the personnel of the State Forest Service which includes the office and supervisory personnel of the forestry and park camps under state supervision, held a barbecue in his honor at Vogel State Park, Neel Gap, in Union county, on October 5.

Vogel State Park was selected as the location for the barbecue because of the fact that the work on the dam at the park by the CCC camp had just been completed and it was desired to dedicate the dam with a fitting ceremony.

Those invited to attend the barbecue included the Commission of Forestry and Geological Development, officials and members of the Georgia Forestry Association and others throughout the state who have worked with the State Forester in solving the problems that he has had to meet in the organization and execution of the work of the Department, and officials of the United States Forest Service and the National Park Service whose offices are located in Atlanta. The outing was well attended and bore evidence of the high esteem in which the State Forester is held.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE BLEACHING CLAYS OF GEORGIA

By Harry X. Bay and Arthur C. Munyan

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U. S. Geological Survey

Note: The State Geologist takes pleasure in presenting below the first of a series of three authoritative articles on the bleaching clays of Georgia. Fuller's earth, a form of bleaching clay, has long been one of Georgia's most important mineral industries. The annual production is valued at close to a million dollars. Georgia has in fact led in the domestic production of fuller's earth since 1924. In very recent years there has been a trend in the industries using bleaching clays toward the use of the bentonitic type of clays that in the natural state have low bleaching power but when activated by treatment with acid have bleaching powers superior to that of fuller's earth. There is grave danger, therefore, that the use of Georgia fuller's earth may gradually decline.

The significance of these articles is that deposits of the bentonitic or activable type of bleaching clay have been discovered in Georgia by this investigation. Funds were not sufficient to determine the extent of most of these deposits. Further prospecting should be done at once in the favorable areas outlined in this article if Georgia is to retain her leadership in the production of bleaching clays.

RICHARD W. SMITH

State Geologist.

ARTICLE I

Introduction

As a part of the program sponsored by the Federal Emergency Administration of Public Works, a preliminary investigation of the bleaching clays of Georgia was conducted by two parties of the United States Geological Survey. The first party, in charge of Mr. Bay, was in the field during the fall of 1934; the second, headed by Mr. Munyan, made its investigation in the spring of 1935.

The so-called "bleaching clays" may be separated into two distinct groups—the naturally active and the activable types.

Naturally active bleaching clay is a mineral substance having physical properties, in the native state, which give it a capacity for decolorizing or clarifying (bleaching) oils and fats. Clay of this type is generally known as "fuller's earth."

Activable clay is a natural material which through a process of partial acid leaching acquires physical properties that make it a highly active bleaching agent for oils and fats. The most powerful of the bleaching clays belong to this group. Not all clays known as "bentonites" are made highly active by chemical treatment, but bentonites provide our most efficient activable clays.

A few naturally active clays are improved by acid leaching but most of them are rendered less active by such leaching. The most powerful bleachers are inactive until leached.

The bleaching clays are as a rule very fine-grained, but in many places they in-

clude an admixture of sand particles and mica. The colors are ordinarily light, ranging from white to gray or pale green, but they may be pink, tan, brown, dark green, blue, or even black. Freshly opened beds ordinarily exhibit a waxy or soapy luster, and some varieties may be cut into thin shavings like soap. Many varieties are hard and brittle, but some are soft and crumbly or even plastic. Certain types possess conchoidal fracture; others show platy, hackly, or no distinctive fracture. Jointing is common in most beds. The surfaces of many of the joint planes are darkened by manganiferous stain. Many bentonites have a strong affinity for water and will absorb three times their weight or as much as ten times their volume of water, with a consequent increase in volume. Most active clays do not slake in water, but slaking is a characteristic feature of the activable clays.

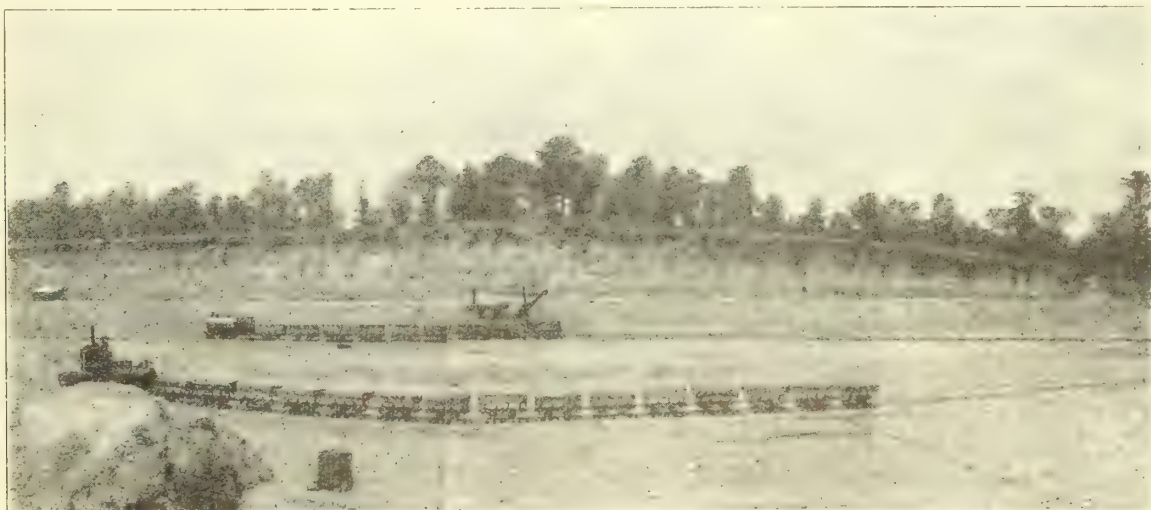
The original use of bleaching clay (naturally active) was to remove grease and fat from woolen cloth during the process of fulling. This practice gave rise to the name "fuller's earth," a term which has been retained in spite of the fact that earth for cleaning cloth has been replaced by more efficient materials so that at the present time its use for that purpose is slight.

Nearly 93 per cent of all fuller's earth produced in the United States in 1933 was used in decolorizing mineral oils; about 6 per cent was employed in treating vegetable oils and animal fats; and less than 1 per cent was utilized for fulling cloth or for other purposes.¹

The activated clays find their principal application in the refining of mineral and vegetable oils and animal fats. This type of clay is particularly valuable where strong bleaching properties are required.

The use of naturally active clay for bleaching edible oils in the United States began about 1880. English clay (that used for fulling cloth) was found to be the most

¹ Minerals Yearbook for 1933, p. 973, 1934.



Fuller's earth mine at the Attapulgus Clay Company, Attapulgus, Decatur County, Georgia

satisfactory of all that were available at that time. The first attempt to mine fuller's earth in this country was made in 1891, when a bed of Tertiary clay, was opened near Alexander, Arkansas. This material was used locally in the treatment of cottonseed oil. A short time later fuller's earth was discovered in the Hawthorn formation near Quincy, Florida. This find led to the development of mining activities in Georgia and Florida which, as clay operations, are second to none throughout the world.

During 1933 the production of fuller's earth in the United States amounted to 251,158 short tons, much of which came from Georgia and Florida. Georgia first entered the fuller's earth field in 1904 and has been the largest domestic producer since 1924, when its output for the first time surpassed that of Florida, which had led since 1895. Including 1933 the total production for Georgia reached 1,172,495 short tons.²

This total production represents a value of more than \$16,000,000. Bleaching clay (fuller's earth) is, accordingly, one of the most valuable natural resources of the State.

The early history of acid-treated clays is somewhat vague. It has been stated³ that the activation of clay by treatment with either concentrated or dilute acids has been practiced for many years in Europe. Germany has long exported activated bleaching clay to the United States. The commercial production of acid-treated bleaching clays in this country probably began in the period between 1920 and 1925. The present yearly production is thought to be about 7,000 tons.

² Minerals Yearbook for 1933, p. 976, 1934.

³ Bierce, N. E. Some historical notes on the origin of contact filtration: Nat. Petroleum News Dec. 14, 1927, p. 102.

The excavations at Savannah recently made under the direction of the Division of Geology have been widely commended upon by paleontologists. The bones of pre-historic animals that were there found are particularly well preserved. Several of the country's larger museums have expressed a desire to obtain specimens and it seems probable that a more intensive search may be made by the staff of one of these museums.

Lane Mitchell, Assistant State Geologist, attended the ninth annual field conference of the Kansas Geological Society. The itinerary of the excursion included stops at Iowa City and Dubuque, Iowa, LaCrosse and Madison, Wisconsin, and Minneapolis, Minnesota. Members of the conference studied the Paleozoic and the pre-Cambrian rocks of the middle western states.

PUBLICATIONS OF INTEREST TO GEORGIA MINERAL PRODUCERS

The State Geologist wishes to call to the attention of the mineral producers of Georgia the MINERALS YEARBOOK 1935 compiled by the U. S. Bureau of Mines and just released on September 30. The supply of copies available for distribution is quite limited. The new volume carries forward the statistical information and economic discussions on mining printed in various former publications including MINERAL RESOURCES OF THE UNITED STATES which was issued annually for over half a century.

The 1935 volume continues the advances made in its immediate predecessor and incorporates many improvements based on constructive suggestions volunteered by close observers and students of the mineral industry. In addition to accurate official data on all commercially important minerals, there is a resume of the principal economic developments in mining, as well as chapters dealing with the progress in coal utilization, uses of petroleum fuels, petroleum and natural gas production, mine safety, and mineral developments from a world viewpoint. A new chapter on miscellaneous commercial gasses and another on minor nonmetallic minerals appear for the first time. Recommendations of the National Resources Board and activity under the National Recovery Administration are reviewed in the commodity discussions. Important occurrences in gold and silver mining and markets are thoroughly surveyed, supplemented by detailed reviews of activity in the metal mining districts of the various States.

Mining engineers and executives as well as students of business will find the MINERALS YEARBOOK an indispensable tool and will appreciate the convenience in having the data condensed into one volume of 75 chapters. All statistical material is presented in concise summary form and 129 graphs illustrate the principal trends in various branches of the mineral industry; a complete index greatly adds to the reference value of the volume.

Copies of the Yearbook, in blue cloth binding, may be purchased at a price of \$2.00 (money order, no stamps accepted) from the Superintendent of Documents, Government Printing Office, Washington, D. C.

REPARTEE IN COUNTY COOS

Harold Young's Wife Alta: "What color dress will you wear to the fire warden's dance?"

Keith Young's Wife Grace: "We're supposed to wear something to match our husband's hair, so I'll wear black. What will you wear?"

Harold's Wife: "Oh, I don't think I'll go, my husband is bald."

SEEDLINGS FOR 1936 PLANTINGS

Those Desiring Seedlings Are Advised To Place Orders Early—Prices Given.

Farmers, landowners and others interested in securing seedlings from the state nurseries for the purpose of reforestation denuded, or idle lands, or for soil erosion projects, are advised to send their orders to the Georgia Forest Service well in advance of the shipping season, State Forester B. M. Lufburrow announces. Orders for 1936 plantings have already begun to come in.

For the past year the demand for seedlings exceeded the supply, but the state nurseries have a good supply on hand this year and hope to be able to fill all orders.

Prices for the 1935 crop are as follows:

Slash pine	\$2.00 per thousand
Loblolly	\$2.00 per thousand
Longleaf	\$2.50 per thousand
Black Locust	\$3.50 per thousand
Black Walnut	\$3.50 per thousand

These prices are f. o. b. Albany for the pine seedlings and f. o. b. Blairsville for black locust and black walnut.

In placing orders for seedlings, 10 per cent of the total purchase price must be sent with the order to the Georgia Forest Service, Atlanta.

TIMBERLAND OWNERS SPEND \$182,000 ON FIRE PROTECTION

Georgia land owners, in timber protective organizations, spent \$182,000 for fire protection in the fiscal year ending June 30, according to an announcement made by B. M. Lufburrow, state forester. This was the largest amount ever expended in any one year during the past ten years of operation, Mr. Lufburrow said.

For the fiscal year 1936, members of the timber protective organizations have budgeted \$246,229 to be spent in fire protection. The main items of expense to landowners in these organizations are the building of primary and secondary firebreaks, maintenance of telephone lines, and salaries of 82 patrolmen and 7 towermen.

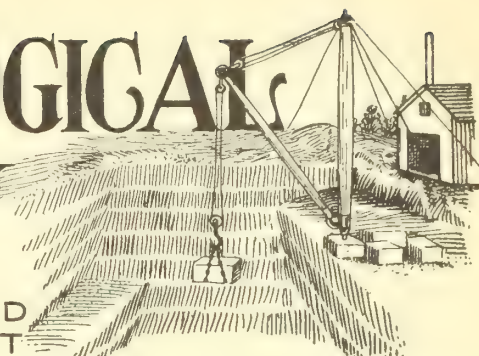
A total of 6,181,114 acres of forest land are under protection, of which 4,181,114 acres are in organizations and pay their own operating expenses; the remaining 2,000,000 acres are on adjoining properties.

In the program of the timber protective organizations for the coming year are plans for the extension of 1,422 miles of telephone line, the construction of 15,460 miles of firebreaks, together with maintenance of the 16,056 miles already constructed.

The 20 CCC camps throughout the state have contributed in a large measure to fire protection; during the past year they have constructed 7,863 miles of firebreaks and many miles of telephone line.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



Vol. 5

ATLANTA, GA., NOVEMBER, 1935

No. 11

GEORGIA STATE PARKS HISTORICAL AND RECREATIONAL DEVELOPED TO GREAT EXTENT DURING PAST THREE YEARS THROUGH COOPERATIVE EFFORTS OF FEDERAL AND STATE AGENCIES

A system of State Parks, located within easy reach of citizens of the State of Georgia, has been the goal of the Department of Forestry and Geological Development for many years. This goal has been partially reached in the establishment of eight State Parks, namely:

Indian Springs—Butts County.

Vogel—Union County.

Alex. H. Stephens Memorial—Taliaferro County.

Fort Mountain—Murray County.

Pine Mountain—Harris County.

Chehaw—Dougherty County.

Little Ocmulgee—Telfair County.

Santo Domingo—Glynn County.

In the selection of the site of each of these state parks, much thought was given to the suitability of the areas, with reference to their forest growth, natural beauty, proximity to main highways, areas of the State to be served, historic interest and possibilities of development of out-door recreation.

The state park system is being developed through the co-operation of the Department of Forestry and Geological Development of the State of Georgia, and the State Park Division of the National Park Service. Since the beginning of the Emergency Conservation Work of the Civilian Conservation Corps, the state parks in Georgia have increased from three to eight.

Approximately \$1,750,000 has been contributed to state park construction in Georgia by the Federal Government prior to October 1, 1935. The parks now under construction will be maintained and operated by the State Department of Forestry and Geological Development. A short description of each of the state parks now under construction follows:

Indian Springs State Park

Indian Springs State Park is located in Butts County, Georgia, on the highway between Atlanta and Macon, via Forsyth. It is the oldest state park in Georgia and was part of the original grant by the Creek

Indians to the State of Georgia. At the beginning of the present park construction program, this park contained only twelve acres, but in the last two years two hundred and thirty-eight acres adjoining this original land has been purchased by public spirited citizens of Butts County and given to the State.

Ever since Indian days the curative properties of the mineral spring on this Park have attracted many visitors.

On this Park is the site where the treaty ceding to Georgia the lands between the Flint and Ocmulgee rivers, and as far north as the Chattahoochee, was signed by Chief McIntosh of the Creek Indians.

Trails and roads have been built throughout the park; picnic grounds are provided; a stone arch entrance bridge constructed; the old wooden casino replaced by a beautiful new stone building; an Indian museum building erected; a water supply system installed and comfort stations improved, and much landscape work and planting done. This park is a very popular place for picnics, parties coming from all over the State. Adequate hotel facilities are available in the town of Indian Springs, Georgia.

Further development work is in progress at the present time.

Vogel State Park

Where the Appalachian highway crosses the Blue Ridge Mountain in Georgia, 3108 feet above sea level, is Neel Gap. At Neel Gap is one of the park areas owned by the State, Vogel State Park, consisting of 166 acres. Two acres on the top of Blood Mountain, twelve acres half a mile north of Neel Gap, and ninety-three and a half acres, three and a half miles north of Neel Gap, are the four areas owned by the State and known as Vogel State Park. The four areas are surrounded by the Cherokee National Park.

The Appalachian Trail from Georgia to Maine crosses Vogel Park at Neel Gap.

(Continued on Page 2)

RECREATIONAL FORESTRY

By
C. N. ELLIOTT

During the past two years, since the organization of the "New Deal", perhaps the most outstanding development of any one profession has been in the field of forestry. Since 1870 there has been a constant struggle by the federal government and by the individual states to make the American people "forest-minded", to teach them that lumber is only one of the less important of hundreds of uses for a tree. Due to insufficient funds and lack of trained men, the struggle has been a long, uphill one.

In the past two years, however, more has been accomplished in forestry than during any two previous decades. To two million men between the ages of 18 and 25 forestry has ceased to be a vague term and has become a reality. To some five or six million parents, brothers and sisters, forestry has changed from a romantic term to a means of livelihood and to a stream of letters pouring home from the mountains, from the coast and from forest areas scattered over the entire United States.

While this development has been more or less along the mushroom order, it has carried with it a number of concrete and permanent changes. A new era has grown out of the old. There no longer exists the type of lumberman who cleans out the forest, taking one log out of a tree where he might have several, laying waste to the cut-over forest by fire, and moving on to destroy the next forest in the same ruthless manner. Not only is the first number one log now used out of a tree, but in many instances, the top and roots as well. The practice of piling and burning logs has ceased. Smaller trees are being left as representatives of future forests. Public sentiment is rapidly growing to the point where it will demand a tree planted for each one taken out of the forest. There must be a balance between utilization, preservation and restoration.

Out of the jumble of new ideas and phases of development has sprung a new and entirely justifiable branch of forestry, named recreational forestry. After many long years, man has finally discovered that

(Continued on Page 4)

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

GEORGIA STATE PARKS

(Continued from Page 1)

Trail shelter cabins along this trail are available for the use of hiking parties. Much improvement work has been done in this park in the last two years. At Neel Gap a large parking area has been provided, a tea room constructed, two overnight log cabins provided and a beautiful overlook constructed which provides a view of the gorge on the south of the Gap and of the mountains north of Neel Gap, including Enotah Bald, the highest mountain in Georgia.

In the area just north of Neel Gap, known as the Notla Falls picnic area, open fireplaces, picnic tables, comfort station, picnic shelter, parking area and complete facilities for picnics have been provided. This area has been landscaped and planted with many thousands of trees and flowering shrubs.

A trail shelter cabin has been provided on top of Blood Mountain at a point close to where the Appalachian Trail crosses the mountain.

Three and a half miles north of Neel Gap, a large dam has been constructed, creating a thirty acre lake, which will mirror the surrounding mountains. In this area, roads and trails have been constructed. A large boat and bath house, caretaker's house and vacation cottages are here. A water supply and sewerage disposal system have been constructed around the lake. Planting and beautification work in this area are under way. Many miles of park trails have been built to lead to many points of interest in the State lands and into adjoining lands of the Cherokee National Forest. It is the hope of those in charge of state parks that this park may

be enlarged to an area of 5,000 acres and provide many additional recreational facilities.

The 259 acres owned by the State at Vogel State Park are the gift to the State of Georgia of Mr. Frederick Vogel, of Milwaukee, Wisconsin.

Vogel Park is the second oldest Park in the State and the first to be donated to the State by a private land owner.

Santo Domingo State Park

Located on the southwest bank of the Altamaha river on the Coastal highway between Savannah and Brunswick, Georgia, thirteen and a half miles north of Brunswick, is the Santo Domingo State Park. Santo Domingo State Park covers an area of 350 acres and was given to the State by Mr. Cator Woolford, a public spirited citizen of Atlanta, Georgia.

Santo Domingo is Georgia's first State Monument Park. It has been developed and dedicated to the Spanish occupation of the Coast of Georgia. Interesting ruins on this park have been preserved—potsherds and other artifacts have been found during the development of the Park. With the adjoining plantation it was the site of the ancient Indian settlement of Talaxe, or Talaje. The park was also the site of Elizafield Plantation, an English settlement established just after the Spanish period of occupation.

A beautiful entrance gate, a Spanish type Inn, foot trails, park roads, water supply and sewer disposal systems have been provided. Much landscape work and planting have been done and the park marked with trail signs to direct visitors to points of interest. Large lagoons have been constructed near the ruins and mirror the beautiful semi-tropical growth of the Park. Although covering a small area, this park is one of Georgia's most interesting developments.

Alex. H. Stephens Memorial State Park

Located in Taliaferro County near Crawfordville, Georgia, this State Park of 260 acres was made possible through the combined efforts of the United Daughters of the Confederacy, the State Department of Forestry and Geological Development, and the National Park Service. The original gift of property to this State Park was made by the United Daughters of the Confederacy and the Stephens Monumental Association. This park consists of two units—State Monument Park on which is located Liberty Hall, the home of Alexander H. Stephens, Vice President of the Confederate States and former U. S. Senator, and directly north and adjoining this area, a large area devoted to recreation as the recreational area of the Park.

Liberty Hall, its outbuildings and its grounds have been restored with much careful work, to their original condition when used by Alex. H. Stephens.

On the recreational area an anti-bellum colonial bath house and lake have been

provided, also an observation and water tower and comfort station. Three picnic areas, parking areas, a picnic shelter, and barbecue pit and shelter and several miles of trails and park roads have been constructed. Much landscape work and many thousands of trees and flowering shrubs have been planted. Construction work is still in progress on this park and it is to be enlarged to 1100 acres, with many additional recreational improvements provided.

Fort Mountain State Park

On the top of a mountain twelve miles east of Chatsworth, Georgia, in Murray County, on one of Georgia's most beautiful scenic State highways is located Fort Mountain State Park. This park covers an area of approximately 700 acres, the lands being given to the State of Georgia by public spirited citizens.

The gift of approximately 200 acres on the top of Fort Mountain by Mr. Ivan Allen, of Atlanta, Georgia, was the original gift which made the creation of this state park possible. One of the main attractions of this park are the remains of an old stone fort near the top of Fort Mountain. Much interest has been stimulated in research concerning the history of its origin. Many think that it was built by Juan Pedro, a Spaniard, who led a search for gold following the exploration of De Soto, and that it was constructed as a strategic point for protection against possible attacks by the nearby Indian tribes.

A beautiful scenic park road has been constructed from the State highway to a parking area near the top of Fort Mountain. A stone observation tower has been erected on the top of the mountain, a picnic area with a picnic shelter, open fireplaces and picnic tables have been provided and several miles of trails built. The area has been cleaned up and landscape work and planting are being done.

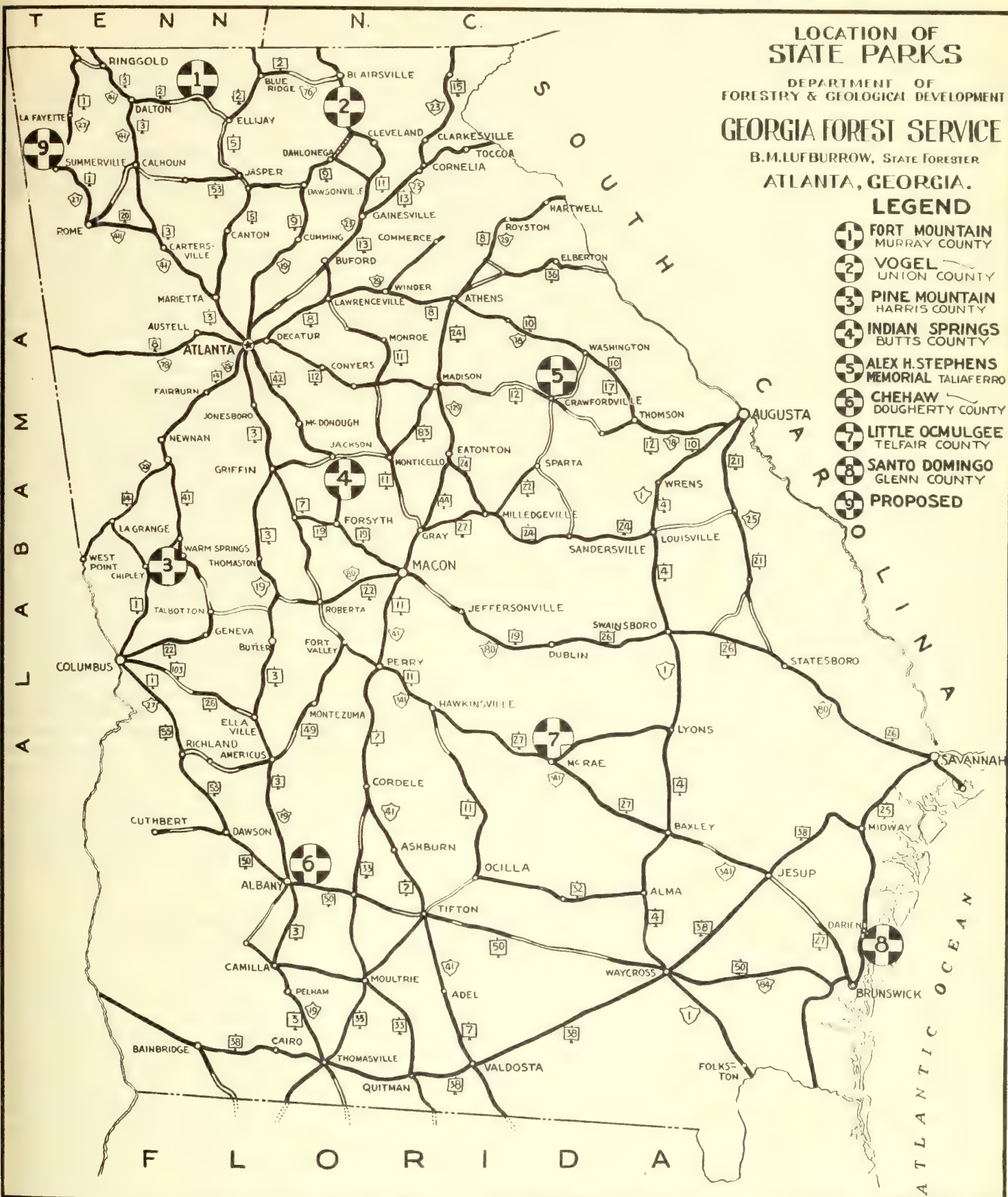
A stone main-use building, a water supply system and comfort stations are under construction.

It is proposed to considerably enlarge this park and to provide many other recreational facilities. When fully developed it will be one of Georgia's most attractive recreational areas.

Pine Mountain State Park

Pine Mountain State Park lies between the Columbus-Chipley-Atlanta highway and the Atlanta-Warm Springs-Columbus highway along the top of Pine Mountain in Harris and Meriwether counties. This park covers an area at present of 1485 acres. This original area was given to the State of Georgia by the Pine Mountain State Park Association, which raised funds for its purchase through local subscriptions. This park is being enlarged to 6200 acres and will be served by a 300 foot parkway from Tip Top on the Columbus-Chipley-Atlanta highway to the Columbus-Warm Springs-Atlanta highway.

Much work has been done on this park in



the last two years. The work completed to date includes a large stone Inn on the top of Pine Mountain, a water supply system, sewerage disposal system, a large earth dam, a twenty acre lake, custodian's house, several vacation log cabins, several miles of

park roads and some landscape work and planting. Construction is still in progress by two CCC camps located on this park. Many additional recreational facilities will be provided during the coming year.

Chehaw State Park

In Dougherty and Lee counties, two miles north of Albany on the north shore of a large lake formed by the confluence of Muckalee and Kinchefoonee creeks, and (Continued on Page 6)

RECREATIONAL FORESTRY

(Continued from Page 1)

the recreational uses of a forest may be organized into something valuable and permanent. The public has begun to demand that certain beauty spots be preserved, and having been preserved, developed for its enjoyment. That same public has proceeded to prove its demands by flocking to those areas which have been selected and set aside.

To use an example close to home: In 1932, Georgia had two state parks, Vogel and Indian Springs. One was famous for its history and for its well known health-giving water; the other was located on a comparatively new scenic highway, and during the period of its early development, attracted thousands of visitors each year. Its possibilities lay in its location—a pass over the Blue Ridge and the grandeur of the scenery, commanding, as it does, vistas from both sides of the mountain range.

Since the Emergency Conservation Work, or, as it is more popularly known, the Civilian Conservation Corps, began, Georgia's system of state parks has grown from the original two to nine which are so located in the state that they are accessible to every citizen of Georgia and to tourists. Each park has been chosen and developed for a specific reason—history, beauty, recreational facilities such as fishing, swimming, mountain climbing, and each of these outstanding attractions has been emphasized and developed for the enjoyment of the greatest number of visitors.

Recreational Forestry—probably the newest phase of a great work—has proven to be one of the most popular. In this new age, men and women have come to realize that they must play as well as work if their bodies are to be kept healthy and their minds alert. It is well known that we are living in an age of speed, where we are able to accomplish more in a shorter length of time. We have a choice of our leisure time and we are going to use it, either in a profitable or unprofitable manner. Building strong bodies and alert minds will never be unprofitable.

When the average Mr. John Citizen decides to ride a hundred miles away from his home on a pleasure trip, where is he going? The chances are that he will visit some spot of which he has heard, or with which he is already familiar. He wants a spot that offers beauty, fishing, hunting or boating, and one where he will not be embarrassed by someone asking him to vacate immediately.

If the state parks meet his demands, and most of them will, he will visit one of them. He will visit this area not once, but, if he likes it, many times, and he will tell his friends about it, or carry them along.

What part will the recreational forester play in this picture? How will his attitude and actions differ from those of the com-

mercial forester? And how will his role aid in the development of the forestry field?

One of his first responsibilities will be in education. The public must be taught that fire is destructive in the forest. The public must be shown that most snakes and hawks are beneficial rather than harmful; the public must be convinced that if each man, woman and child will do all he and she can to protect the forests and the life contained in them, that nature will do the rest toward creating a perfect balance.

Improvement cutting is undesirable in a recreational forest. Each tree that nature plants there is for a purpose and is not considered in the light of its market value. Black gums are just as important as white oaks, and sassafras trees have a value of their own. Dead snags, where they are not dangerous, are allowed to remain standing. Many species of birds breed in them. Old logs on the forest floor are picturesque and are a part of the forest.

The recreational forest carries many of the same problems as a forest grown and managed for the marts of trade. Fire protection is one. Accessibility is another, and though the policies and treatment of the two types may be different, there is one common bond, one outstanding goal toward which both are rapidly being carried—a finer understanding of the wilderness and the inhabitants within it, and a deeper appreciation of America's most used and most important resource.

EXECUTIVE COMMITTEE FOR FORESTRY ASS'N. ENTERTAINED

James A. Fowler, Soperton, member of the Executive Committee of the Georgia Forestry Association, entertained the Committee and their friends at his home, "Million Pines" on September 27.

The Committee held a business meeting in the morning, after which, among the pines, a most enjoyable and delicious barbecue lunch was served.

Mr. Guy Woolford, President of the Association, presided. After the reports of the members of the different committees were submitted, several inspiring talks were made. On adjournment of the meeting, the guests made an inspectional tour of the Fowler plantation, viewing the vast number of pine trees planted eleven years ago.

The members of the Executive Committee enjoying Mr. Fowler's hospitality were: T. Guy Woolford, B. M. Lufburrow, A. K. Sessoms, Mrs. M. E. Judd, J. M. Mallory, C. H. Herty, C. T. Evans, Dr. William Lee, W. T. Anderson, H. L. Kayton, W. M. Oettmeier and Miss Emily Woodward.

LUFBURROW ATTENDS STATE FORESTRY MEETING

State Forester, B. M. Lufburrow, attended a meeting of the State Foresters held in Montpelier, Vermont, October 14-19.

Many important matters, dealing with the advancement of forestry throughout the United States, were discussed.

DIRECTOR OF CONSERVATION WORK ANNOUNCES CCC EDUCATIONAL PROGRAM

Mr. Fechner Proposes Broader Education for Enrolees in CCC Camps—Schools and Libraries Established.

Robert Fechner, Director of Emergency Conservation Work, has announced that educational facilities in the Civilian Conservation Corps camps will be virtually doubled to take care of the increased number of young men entering the forest and park camps under the expansion program.

The Director stated that a total of \$6,000,000 has been allocated for educational work in the camps. This allotment, he said, will provide necessary funds for maintaining instructional programs in the 2,916 CCC camps which it is planned to operate under the expansion program. It will also permit the Office of Education of the Department of the Interior to increase the number of camp educational advisers to at least 2,200 and to appoint seventy-six district advisers to assist in the coordination of the programs of instruction.

Howard W. Oxley, recently appointed educational director of the Civilian Conservation Corps, estimates that approximately 500,000 men will participate in the CCC camp programs of instruction during the coming winter. The latest reports, he said, disclosed that 176,977 enrollees regularly and voluntarily participated in camp educational activities during May.

In outlining the program of instruction for the greatly increased student body which will be ready when the expansion enrollment program is completed, the Office of Education is concentrating its efforts toward:

1. Training all camp and district advisers in more thorough and practical method of doing their work.
2. Development of outlines of instruction in vocational subjects such as agriculture, cooking, forestry, carpentry, automotive mechanics, soil erosion, conservation of national resources, etc.
3. Providing instruction for all illiterates, for those who are deficient in the fundamental school subjects and for those who desire to continue their high school and college training.
4. Development, after working hours, of constructive, worthwhile activities such as arts and crafts, nature study, outdoor clubs, first aid activities, health and physical education and all forms of athletic recreational activities.
5. Assisting young men in finding jobs by providing instruction in how to write

(Continued on Page 6)

IMPORTANCE OF FIRE PREVENTION

Forest fires have already been reported in various sections of the State. Every precaution should be taken by each of us to prevent this great enemy of the woods from destroying, or damaging, the timberlands. Especially at this time, during this unusually long dry period, should special precautions be taken.

Timber owners, who do not have their woods signed in Timber Protective Organizations, should have their woods safeguarded through organized protection. Records show that fewer fires occur in lands where owners realize the necessity of such measures, than in the districts where they are negligent in protective practices.

The table, that is given, shows the acreage now signed in Timber Protective Organizations throughout the State:

Forestry District	District Forester	Old Acreage	Increase last 30 Days	Per Cent Increase	Total Acreage in TPO's
1	Hursey	240,025			240,025
2	Young	96,600	3,600	3.8	99,600
3	McCrary	33,370			33,370
4	Wallace	200,000			200,000
6	Thurmond	716,353	42,255	6.	758,608
7	Franklin	2,147,614	20,000	.93	2,167,614
8	Story	794,196			794,196
		4,228,158	65,855		4,293,413

PROTECT THE FORESTS FROM FIRE AND INCREASE THE ANNUAL INCOME FROM THEM.

A noble tree makes a direct appeal to almost every heart. Next to man's abode or house or buildings, he gives trees the most historical atmosphere.

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

Walton County T. P. O.

Protection work begun in earnest the 1st of October. Necessary funds for protection work is already in the TPO treasury and Mr. W. B. Meaders has been selected as permanent patrolman. The county officials of this county have aided considerably in getting this organization in operating order. Through efforts of several interested citizens the patrolman has been provided with an office in the Court House, where during bad rainy days and court days he can contact farmers and other interested landowners. The operation of this TPO is based on a county-wide program. The patrolman has charge of the program of membership. Over 200 members are already signed up and every effort is being made to include all land in the county through membership into the organization.

FOURTH DISTRICT

**W. G. Wallace, District Forester,
Columbus**

RECREATION PLUS FORESTRY

Recreation—Forestry—the two go together "like two peas in a pod" and usually with mutual benefit. It is probable that when the first national forests were created by Presidential proclamation of Theodore Roosevelt no thought was seriously given to their value for recreation. Timber conservation and perpetuation was the primary motive, and of course the primary object of the national forests will continue to be that of producing timber, but the fact that over thirteen million people used these forests for recreational purposes in 1934 is proof of their value for such purposes.

Not only do we have an enormous acreage of national forests, all available for recreational purposes, but the states are becoming state forest conscious and are acquiring tracts of forest land to be used after the example set by the national forests. In addition to the national and state forests we also have the national and state parks which of course are highly developed primarily for recreational purposes. Our likes and dislikes vary though, and it is well that they do. Where some people prefer developed areas such as the national parks, others prefer the undeveloped wilderness of the deep forest.

Man is not far removed from the forest by nature. Comparatively, he is just emerging from the time when he lived and died in the forest, fought his battles there, earned his living, and made his home under the trees. The forest still has a hold on most of us which makes us long to spend pleasant hours and days there. In fact, many enjoy spending their lives there. But we are speaking of out-of-door recreation, —not vocation.

What I have to suggest is not new, but I want to discuss it briefly for the pleasure and profit of those who may not realize the value of combining recreation with forestry to make it pay. It is simply this: drop down a few steps from the large national and state forests and parks, and we arrive at the much smaller but similar forest privately owned.

Forest land is cheap and offers a much better investment, I am convinced, than is generally realized. The indications are for increased value of such investment. Simply locate and purchase a tract of land to suit your pocket book, one that is located in the mountains or on a river or otherwise suited to your own individual choice. The pleasure you will receive from time spent in developing your place and playing there will not only be pleasure for the moment, but will be more lasting, for as you develop your place you improve its value

and the trees grow for your profit. Your pleasure from such recreation on your own forest is deeper, more satisfying.

It is not always necessary to go to the mountains to find a desirable tract for recreational as well as forest investment purposes. Probably any citizen in Georgia can locate a tract of land, be it ten acres or a thousand, within a reasonable distance of his home that will be capable of being developed into a desirable country place for both pleasure and profit. If possible, locate and purchase a place close enough that you can go there often. I have such a place myself, and know of several similar cases, all proving to be a rich source of healthful out-of-door recreation while at the same time producing a steady increase in value through annual forest growth.

Everybody longs for a comfortable log cabin located on the shore of a little lake, all surrounded by tall trees, and on land that you can call all your own. Now is the season to plan to own and develop such a place—for pleasure plus profit.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester,
Savannah**

Liberty-Long T. P. O.

The Board of Directors of the Liberty-Long TPO held a meeting last week and worked out plans for putting the plow unit to work constructing secondary firebreaks.

The TPO purchased a 40 Deisel Tractor and Hester Five Disc Plow for use in building secondary fire breaks. This equipment has now been at work for one week and about 40 miles of secondary fire breaks have been put in.

Secondary breaks of the Hester type are about eight feet in width and will be constructed to contain areas of land not to exceed one hundred acres. They plan to put in 600 miles of fire breaks of this type during the fall and winter season.

All work of this type is done under the direct supervision of the TPO Manager and TPO Secretary. The expenditures for this week are paid from pooled funds.

Ocmulgee T. P. O.

The Ocmulgee TPO, covering lands in Dodge, Telfair and Wheeler Counties have been busy for the past month reworking primary firebreaks that were constructed from ECW funds.

To date they have maintained over 60 miles of 20 foot primary fire breaks, using a 40 Deisel tractor and No. 44 Grader that was purchased by the TPO.

They plan to maintain some 200 miles of primary firebreaks and construct in addition 400 miles of secondary breaks using a Hester Plow.

All fire break construction work and maintenance is under the direct supervision

of the TPO Manager and the Sec.-Treas. All types of protection work are paid out of cooperative funds collected on a per acre assessment basis.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

SLASH PINE FOREST FESTIVAL

A Slash Pine Forest Festival with all the Southeastern section joining in the festivities is planned in Waycross for one week beginning November 11. A Slash Pine Festival Association has been set up with K. S. Varn, President, G. M. Bazemore, Treasurer, J. S. Elkins, Secretary and A. V. Kennedy, J. K. Larkin and A. K. Sessions, Vice-Presidents. A Board of Directors has been appointed together with the various committees and plans for the festivities are now being completed.

Manufacturers from all parts of the U. S. are to have exhibits in the large tobacco warehouse chosen for this purpose, and numerous field trips are planned to show various phases of forestry work and the tools and equipment used in this work.

Several of the CCC Camps in this section are planning on having a field day sometime during the week and it is planned to use some of the CCC talent to stage skits at night. A queen of the Festival is to be chosen from some of the surrounding counties and with her court is to rule over the Festival for the week.

This Festival is to be an annual affair and The Slash Pine Forestry Association has been set up for the purpose of planning it for each year. This will be one of the largest Forestry Fairs or Festivals ever held in the U. S. and plans are now underway to make it larger each year.

GEORGIA STATE PARKS

(Continued from Page 3)

lying along the east side of Muckalee Creek is Chehaw State Park, consisting of 800 acres. The lands for this state park were given to the State of Georgia by citizens of the City of Albany, Georgia, as a result of efforts of public spirited citizens of Lee and Dougherty counties and of the civic organizations.

This park is adjacent to the state highway between Albany and Atlanta, and is being developed through the co-operation of the Department of Forestry and Geological Development, the National Park Service and the Civilian Conservation Corps. Many recreational facilities are under construction and landscape and beautification work planned.

As work has just recently been started on this park, it will be some time before its facilities will be available to the public.

Little Ocmulgee State Park

Lying along the Little Ocmulgee river, a clear water stream, is a woodland area of 950 acres, known as Little Ocmulgee State Park. Due to the efforts of civic organizations of the City of McRae, Telfair County, and Wheeler County, the State has been given the lands, included in this development.

Work in progress on this park is being done through the co-operation of the Department of Forestry and Geological Development, the National Park Service and the Civilian Conservation Corps. Many recreational facilities, much landscape work and planting are planned.

E. H. SIMS, Superintendent,
State Park Construction.

DIRECTOR OF CONSERVATION WORK ANNOUNCES CCC EDUCATIONAL PROGRAM

(Continued from Page 4)

letters of application for jobs and how to sell their services in person to the prospective employer.

The duties of each camp educational adviser, according to Educational Director Oxley, are many and varied. He is responsible to the camp commander for all classes and discussion groups in camp; he superintends the work of the instructing staff, comprised of an assistant educational adviser, reserve officers in charge of the camps, members of the technical staff, citizens of near-by communities and enrollees themselves. In May, 20,000 persons were instructing CCC enrollees.

"Growth of the camp school is indicated in a recent report of the educational program issued by the U. S. Office of Education. The report shows that 175,000 enrollees, or 60% of the enrollment strength during May, were voluntarily participating in the educational program. The average number of courses taught per camp in May was eighteen.

"Almost half the courses are vocational in nature with a predominance of courses in typing, auto-mechanics, forestry and agriculture. Sixteen per cent of the courses are on the elementary level. About 4,000 illiterates or near illiterates are receiving instruction in reading, writing and arithmetic.

Twenty-seven per cent of the courses are on the high school level and five per cent are on college level. At the end of the public school term in June a large number of CCC young men were granted eighth grade and high school certificates and diplomas on the basis of the formal credits they had accumulated while attending the camp schools. Other enrollees who were high school graduates continued their academic education through college correspondence courses.

MORE LETTERS OF APPRECIATION TO MR. LUFBURROW

The following testimonials, congratulating our State Forester, on the completion of 10 years service and leadership in his field of work, came too late for publication in the October number of the Review:

"Mr. Lufburrow, personally and as State Forester, may justly feel a pride in the aroused forest consciousness of the citizens of Georgia and of the accomplishments of the Forest Service during the first decade of the work just closed. I extend to him, the District Foresters, and the other members of the staff, my heartiest congratulations."

J. M. MALLORY, Industrial Agent,
Central of Georgia Railway Co.

"When I became interested in the forest resources of Georgia, I think I had my first contact with State Forester, B. M. Lufburrow. While the subject of forestry was entirely new to me, I quickly realized that Mr. Lufburrow was well grounded in his subject, and that he was prepared to treat the same from all practical angles. Because of his fitness and training in forestry, and his love for his native State, he has discharged the duties of his office with enthusiasm, tact and fine ability. I join most heartily with my fellow Georgians in congratulating him upon the success of his decade of service and the progress which has been achieved under his leadership."

G. Ogden Persons,
Judge, Flint Judicial Circuit.

"Having worked ten years with 'Little Luff' in Forestry, I can recommend him as a State Forester. Being five years 'Luff's' senior in the Georgia Forestry Association, of course, he looks to his 'senior Partner' very often for advice. We fight but we always make up."

Mrs. M. E. Judd,
Dalton, Georgia

FROM A GEOLOGIST'S NOTEBOOK

Our Information Circular No. 4 by Dr. Roy A. Wilson on the gold deposits of Georgia was reviewed by Dr. Waldemar Lindgren, noted economic geologist, in the Annotated Bibliography of Economic Geology for 1934 as follows:

"In this short but well-prepared circular the author in cooperation with the State Geologist, R. W. Smith, presents an excellent review of the gold deposits illustrated by sketch map and section. The statements are constructive and exact . . ."

A display of the Common Rocks and Minerals of Georgia at the annual conference of the Georgia Appalachian Trail Club held at Cloudland, Georgia on October 12th excited much favorable comment from the many distinguished guests there.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE BLEACHING CLAYS OF GEORGIA

By Harry X. Bay and Arthur C. Munyan
Published by Permission of the Director,
U. S. Geological Survey

ARTICLE II

Deposits of Bleaching Clay

Bleaching clays are widely distributed in Georgia, and although at the present time only the naturally active type (fuller's earth) is being produced, recent investigations have disclosed deposits of the activable type. The bleaching clays of the State occur in five distinct geologic units (see accompanying map). From oldest to youngest these are (1) the bentonite in the Ordovician Chickamauga limestone, in the northwest; (2) the fuller's earth in the Eocene Midway formations, of Stewart County, (3) the fuller's earth in the Eocene Barnwell formation, in the central and east-central part; (4) the bentonitic (?) clay in the Oligocene Flint River formation in the south-central and southwestern part; and (5) the fuller's earth and bentonitic (?) clay in the Miocene Hawthorn formation, in certain of the southern counties.

The accompanying map indicates most of the localities visited by Mr. Bay, but of those noted by Mr. Munyan all exposures not considered as of possible commercial value were omitted, and only those of the best quality are shown.

Ordovician (Chickamauga) bentonite

A bentonitic phase of the Ordovician Chickamauga limestone is exposed on both the eastern and western flanks of Lookout Mountain, in northwestern Georgia. In parts of Chattooga, Dade, and Walker counties this zone crops out in thin beds of steep dip.

The bentonite in this area occurs in two zones that are separated by several feet of bluish-gray limestone. The upper zone, which crops out in the vicinity of High Point station and Coopers Heights, in Walker County, reaches a thickness of about 2 feet and consists of mottled light-brown or pale-green soft, mealy, highly micaceous bentonite, which locally contains small white limy concretions and a slight admixture of fine-grained sand. The lower zone, which is well developed south and west of Cassandra, in Walker County, and at Harrisburg, in Chattooga County, reaches a maximum thickness of about 8 feet and is composed of greenish-gray to pale-green soft and mealy to hard and brittle, micaceous, very slightly sandy bentonite.

Exposures of the Chickamauga bentonite

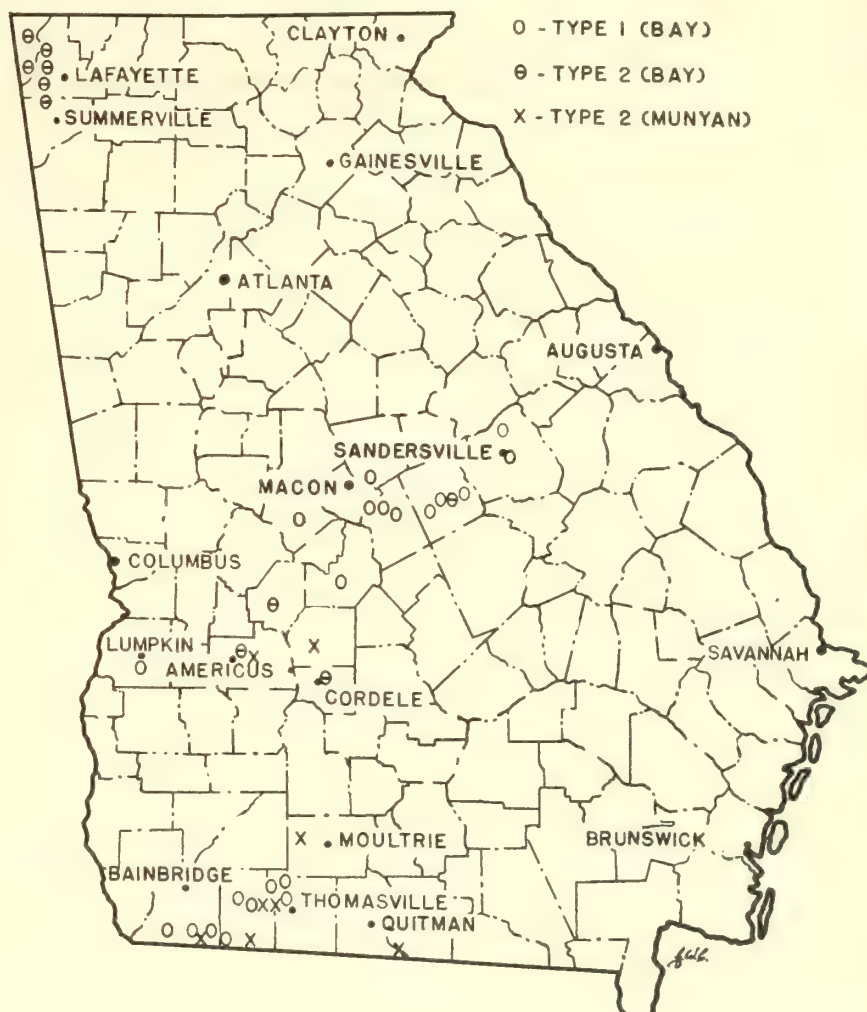
have been noted near Harrisburg station, in Chattooga County; in the vicinity of Trenton and Rising Fawn Furnace, in Dade County; and near High Point station, Coopers Heights, Cassandra, and Cedar Grove, in Walker County.

Laboratory tests of numerous samples of this bentonite from Chattooga, Dade and

stone and are inclined at angles as great as 45°. The maximum thickness is thought not to exceed 8 feet. Such a thickness of clay occurring between thick limestone beds and dipping at high angles would offer serious difficulties in mining. These factors, coupled with the moderate degree of activability of the bentonite, probably preclude any large-scale commercial activity in this field.

Eocene (Midway) naturally active clay

The Eocene Midway formation of Georgia occurs in a narrow belt of northeast trend (extending from Fort Gaines, on the Chattahoochee River, to Montezuma, on the Flint River, and thence a short distance into Houston County). It is the surface



Outline map of Georgia showing general localities in which bleaching clays were examined. by H. X. Bay and A. C. Munyan as indicated. Type 1 includes the naturally active clays and type 2 the activable clays.

Walker counties show that in the natural state it is essentially lacking in oil-bleaching properties. The bleaching qualities are materially improved by partial acid leaching, and many samples were found that very nearly approached the lowest limit of bleach allowable for commercial activable clays. It is rather doubtful if under present conditions this clay could compete with the more efficient activated clays now supplying the market.

Both the upper and the lower bentonite beds lie between thick layers of hard lime-

formation over much of Clay, Quitman, Stewart, Randolph, Marion, Schley, Webster, and Macon counties.

Although consisting primarily of ferruginous sand and white clay, together with fossiliferous, limestone, marl and quartzite, the formation in certain areas is known to contain beds of low-grade naturally active clay (fuller's earth). Materials of this type are well developed in Stewart County and probably occur elsewhere within the State.

(Continued on Page 8)

THE BLEACHING CLAYS OF GEORGIA

(Continued from Page 7)

In the vicinity of Lumpkin, Stewart County, the fuller's earth stratum reaches a maximum thickness of about 20 feet and probably maintains an average of about 10 feet. The thickness varies considerably within short distances. A pit 5½ miles south of Lumpkin exposes 15 feet of dull gray to white (when dry) clay, which is more or less micaceous throughout, especially toward the base. The upper several feet is distinctly sandy, and the entire thickness includes a varying percentage of fine-grained sand. The bed is highly jointed, and the joint planes are discolored by iron and manganese stains. The clay breaks with conchoidal fracture.

Laboratory tests indicate that the clay in the Midway formation south of Lumpkin, in Stewart County, is a low-grade naturally active clay that is not materially affected by acid treatment. Its bleaching efficiency for oil is inferior to that of various fuller's earths being mined and marketed elsewhere in the State, and hence this clay cannot be expected to compete with the others.

Eocene (Barnwell) bleaching clay

Outcrops of fuller's earth and similar clays belonging to the Twiggs clay member of the Barnwell formation occur in a narrow belt extending more than halfway across the State. The westernmost exposures are in Dooly County, and the belt continues northeastward to the Savannah River near Augusta, with exposures in Houston, Crawford, Twiggs, Bibb, Bleckley, Wilkinson, Jones, Baldwin, Washington, Glascock, Jefferson, Burke, Richmond, and Columbia counties.

The Twiggs clay member consists typically of greenish-gray or dark-blue clay of low specific gravity, not plastic but breaking with hackly or conchoidal fracture. Some of the clay is free from grit, but most of it is slightly sandy, and interlaminated and interbedded sand is common. The fuller's earth grades laterally into limy clay of similar appearance and properties and thence into clayey limestone.

In the Pikes Peak area of Twiggs County and possibly elsewhere within the State there are two well-defined beds of fuller's earth separated by about 50 feet of clayey sand. The lower bed reaches a maximum thickness of about 45 feet; the upper bed probably about 25 feet. The lower bed is somewhat limy, especially so toward the base, where small limy nodules are common. It lies directly above the Ocala limestone.

During this investigation sections of the fuller's earth beds in the Twiggs clay member were examined in Crawford, Houston, Jones, Twiggs, Washington, and Wilkinson counties. The lithologic character, general features, and modes of occurrence of the clay are more or less uniform throughout this general area. In spite of the homogeneity of the clay beds a considerable

variation in oil-bleaching efficiency has been noted in samples tested from this region. Many samples failed to meet the requirements of commercial bleaching clay, even though they appeared to be identical with others that were true commercial clays. Although the Twiggs clay has long been known to be naturally active material suitable for oil refining, its activable character has apparently gone unnoticed. In general, the oil-bleaching quality of the Twiggs clay is improved by treatment with acid. In most occurrences the increase in bleaching efficiency would not be sufficient to warrant acid treatment on a commercial scale, but locally the clay reaches a degree of activability that compares favorably with the oil-bleaching properties of the activated clays that supply the present demands. A marked degree of activability was noted in the fuller's earth in certain exposures of the lower clay zone in Twiggs County and also south and west of Irwinton, in Wilkinson County. It is thought entirely possible that careful and methodical prospecting will disclose phases of the Twiggs clay in central and eastern Georgia that are sufficiently activable and extensive to support commercial development.

By far the best-known deposit of fuller's earth in the central part of the State is that being mined by the General Reduction Company, of Macon. This company began mining operations at Pikes Peak, in Twiggs County, in 1908, and has been active since that time. A small mine is being worked by Marvin Hall, 7½ miles northeast of Irwinton, Wilkinson County, and F. H. Opper, Inc., of Savannah, controls a deposit between Irwinton and McIntyre, also in Wilkinson County. It is reported that the bleaching clay marketed from the Barnwell formation is particularly adapted to the refining of vegetable oils and animal fats, and a large part of the output is utilized for those purposes.

GEORGIA MINERAL SOCIETY ELECTS NEW OFFICERS

Professor John L. Daniel, industrial chemistry professor at Georgia Tech, was elected president of The Georgia Mineral Society for the coming year when the Society held its annual meeting Monday night, October 7th. Prof. Daniel took charge of the meeting upon election and presided during the election of T. Emory Bradley as Secretary and Lathroe Baker as Treasurer. H. P. Nelson was elected Vice-president.

Accomplishments of the Society since its formation last February were reviewed by the retiring President, Dr. Frank Daniel. A growth to a membership of thirty was disclosed and numerous feature speakers, field trips, and excursions were recalled in the annual report. The retiring president urged that the Society undertake as its major project for the coming year the compiling and publishing of a catalog of all known mineral locations in the state.

The Secretary and Treasurer, Lane

Mitchell, disclosed in his report a year of growth as attested to by correspondence and publicity and a sound financial condition.

An early field trip to the Macon Indian Mounds and to Holton Quarry and Brown Mountain near Macon, was proposed. Dr. Leon Smith, of Wesleyan College, will be leader of the trip, Dr. G. W. Crickmay, program chairman, announced.

Dinner was served to the group by ladies of the Peachtree Christian Church. The meeting was held in the church dining room.

EXHIBIT OF NATIVE GEORGIA POTTERY

The Division of Geology, the Department of Ceramic Engineering of the Georgia School of Technology, and the China Department of Rich's, Inc., are cooperating in sponsoring an exhibit in January of the pottery produced from Georgia clay by some 15 small potteries scattered throughout the State. Comparatively few Georgians know of the useful and artistic products made by hand by these skilled potters, most of whom are descendants of early settlers from the pottery districts of England. To popularize this Georgia product, the potters will exhibit their ware, for which prizes will be offered for the best jugs, churns, and art ware, and will demonstrate how it is made. The Georgia School of Technology will offer a two-day free school for the potters to help them improve the quality of their product.

APPALACHIAN TRAIL CLUB ANNUAL MEETING

The sixth annual meeting of the Georgia Appalachian Trail Club was held at Cloudland, Georgia, on October 12 and 13 with an attendance of approximately 125 members and guests. The speakers at the banquet Saturday night included Warner Hall, president of the club, who acted as toastmaster; Richard W. Smith, State Geologist who welcomed the visitors; J. H. Gadsby of the National Park Service; Mrs. M. E. Judd of Dalton, Georgia; Dr. Walter B. Jones, State Geologist of Alabama; and Harvey Broome of Knoxville, Tennessee. The banquet was followed by square dancing and singing around the open fire.

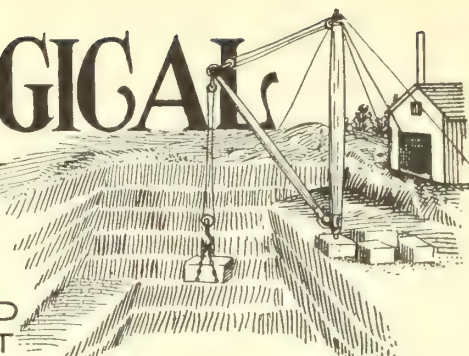
The speakers at the Sunday morning breakfast were Benton MacKaye, Father of the Appalachian Trail; Congressman Robert Ramspeck; Mrs. E. L. Matthews of the Florida State College for Women; and representatives of the Smoky Mountain Hiking Club, the Cumberland Appalachian Trail Club, the Georgia Academy of Science, the Society of Georgia Naturalists, and the Atlanta Girl Scouts, Camp Fire Girls, and Boy Scouts. The breakfast was followed by a trip to the DeSoto Falls State Park in Alabama.

A feature of the meeting was a photographic contest that brought forth many excellent pictures taken by the Club members during the past year.



FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



Vol. 5

ATLANTA, GA., DECEMBER, 1935

No. 12

SLASH PINE FOREST FESTIVAL HELD IN WAYCROSS NOV. 11-16

POTENTIALITIES OF SECTION STRESSED—EXHIBITS EMPHASIZE PRODUCTION, CONSERVATION AND UTILIZATION OF FOREST PRODUCTS

The Slash Pine Forest Festival, heralded as the biggest celebration ever staged in Southeast Georgia, was held in Waycross during the week of November 11-16.

The Festival was opened with an Armistice Day celebration sponsored by Ware County Post No. 14 of the American Legion, with thousands of people thronging the streets.

Following the gala parade, described by old citizens as "the biggest procession South Georgia has ever seen", a life size roughboy monument was dedicated at the Legion park to the boys from Ware county who gave their lives in the World War.

The program, glorifying a tree which promises to revolutionize the industrial and agricultural life of the entire south, included educational and entertainment features which surpassed any forest fair previously held. The festival itself is one of the bright spots in the phenomenal development of a program for the preservation and utilization of the southern pine.

A large tobacco warehouse housed the exhibits which demonstrated uses of the forest from a recreational and commercial standpoint. Reporting the location of forest fires by radio was a feature of one exhibit. In addition to booths attractively decorated showing contrasting areas of burned and unburned woods, there were commercial exhibits of naval stores and other forest products, fire fighting tools and equipment and exhibits by local clubs and business concerns. The Georgia Forest Service and the U. S. Forest Service had exhibits of educational value.

In one end of the warehouse was the auditorium where programs were held. Prominent speakers from Georgia and neighboring states discussed questions pertinent to the forestry program in the South. Music was furnished by a local band.

On Tuesday, November 12, V. L. Harper, of the Southern Forest Experiment Station, Lake City, Florida, gave a talk on "The Method of Collecting and Storing

Pine Seed, to Obtain Best Results."

Wednesday was designated as "Herty Day" honoring Dr. Chas. H. Herty, pioneer in the utilization of pine pulp for the manufacture of paper and rayon. Speaking to a large audience, Dr. Herty said, "The main drawback to the advancement of the paper and rayon industry, using the slash pine, is finances." He showed how much cheaper paper could be made from the pines of the south than from those of the north. "The slash pine can be used for other purposes, and should be propagated and protected by the people of southeast Georgia", Dr. Herty said.

On Wednesday afternoon, Dr. William A. Hartman, regional director for the Resettlement Administration division of land utilization, with headquarters at Montgomery, Alabama, under whose direction the Georgia Coastal Flatwoods Upland Game Conservation project of 30,000 acres is being established near Waycross, gave an interesting summary of resettlement work throughout the southeast.

He stated in connection with the project near Waycross, "This project is based on the purchase of 30,000 acres of land immediately south and southeast of Waycross in Ware and Brantley counties.

Physical, social and economic conditions within this project are more or less typical of comparable conditions in the major portion of the fourteen adjoining counties. The economy is based largely on timber with only scattered areas developed and suitable for farming. Other industries do not play an important part in these fourteen counties.

The development planned for this project is to demonstrate how the entire problem area can be returned to its natural uses including wild life conservation, pasturage, recreation and forestry. It should result not only in reducing costs that the local and state governments now bear for upkeep of the roads and schools, but should

(Continued on Page 2)

THE IPS ENGRAVER BEETLES IN THE SOUTH

Dr. T. E. Snyder, Bureau of Entomology and Plant Quarantine, of the Southern Experiment Station, New Orleans, Writes on Damage Done by This Insect.

Nearly every year throughout the Gulf States in summer and early fall, many pines die infested by the Ips engraver beetles. The dying of these trees is often wrongly attributed to the ravages of the destructive southern pine beetle. The Ips beetles normally breed in green felled timber, fresh pine slash, or pines in a dying condition. When, however, large numbers of trees have been affected by storms, fire, drought (rainfall of one inch or more below normal during the growing season—March to October) or other untoward conditions and thus materially weakened, these insects may increase to such proportions that they become a menace to healthy timber.

Much of the direct damage to the living healthy trees is caused by the adult beetles. These beetles bore through the outer bark into the inner soft layers and construct narrow, long, straight channels or egg galleries that engrave the wood. (In contrast, the gallery made by the southern pine beetle is a long S-shaped burrow). The first evidence of attack by engraver beetles is the presence of pitch tubes all along the stem, or spots and reddish boring dust or "sawdust" on the bark, or a slight change in the color of the foliage.

As explained before, the Ips engraver beetles rarely attack trees that are not dying or severely weakened; consequently, direct control measures have not been generally recommended. Invariably, when conditions return to normal, outbreaks disappear. No control measures are recommended for infested trees occurring singly or in small numbers, since such trees usually have already begun to die as the result of injury inflicted by some other agency before they are attacked by the Ips beetles. If trees die in large groups (usually 25 or more trees), felling and barking the infested trees is recommended. Control methods instituted too late are often responsible

(Continued on Page 3)

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

SLASH PINE FOREST FESTIVAL HELD IN WAYCROSS NOV. 11-16

(Continued from Page 1)

also in time create a new source of wealth through increase in values of natural resources in this area.

The location of the project includes nine miles of frontage on U. S. Highway No. 1, which is one of the main highways to Florida, and this will greatly increase the value of the demonstration.

The development of recreational facilities and the deer, wild turkey and other game on the area will attract the tourist and others interested in shooting the game both with cameras and guns. Some optimistic technicians predict that fees from the sale of hunting and camping privileges alone will more than repay the maintenance costs within a few years.

Part of the project will be developed to demonstrate the practicability of correlating livestock grazing with game and forestry management.

This multiple-use project to be established on this project will provide profitable employment to many. It will also give some training in conservation work in all of its phases to those living on the area and the influence of this training should in time spread to the surrounding community and gradually result in sound land use programs all over the section."

Thursday was dedicated to Braswell Georgia District, sponsor of national legislation for developing the paper industry in Deen, Congressman from the Eighth Georgia south. Speaking on "What Practical Forestry Means to the Southeast", Mr. Deen asserted that proper protection of the forests from fire and constructive re-

forestation programs are essential to the economic welfare of the nation. He further said:

"From 1907 to 1929 the decline in the use of lumber averaged two hundred million board feet annually. In 1929, 55 billion board feet of lumber was used, while in 1932 the amount consumed had decreased to 10 billion board feet. This decline in 1932 was abnormal, but the fact remains that substitutes for lumber in construction has greatly reduced the South's great source of wealth.

"Lumber produced from young pine trees which have just been worked for turpentine is just as inferior as beef which comes from the butchering of a milch cow. Long ago we learned that it was necessary to produce one type of cattle for beef and another type for dairy purposes. This same application is going to be essential in the production of timber for naval stores on the one hand and lumber on the other."

He pointed to the decline in the use of crossties because of the decline in the activities of railroads, and to the development of the wood turpentine industry which has cut the use of gum turpentine.

"The success of the naval stores industry", Mr. Deen continued, "depends not only on a satisfactory export trade, tariff regulation and domestic consumption of these products, but also on the finding of new uses both of naval stores products and the timber supplies from which the products are derived."

Mr. Deen asserted that it is not surprising that the people of the southeast are vitally interested in the sowing of carpet grass seed on their waste lands as a foundation for a great cattle industry, and in the development of the great pulp and paper industry which will utilize the pine trees that grow in the southeast more rapidly than in any other section of the world.

He strongly commended the work of Dr. Chas. H. Herty in the laboratory in Savannah, and declared that there is not the slightest doubt that pine pulp will be used in the manufacture of the bulk of newspaper and other forms of paper in the future.

State Forester B. M. Lufburrow, under whose direction the state forestry program is conducted, was the principal speaker Thursday evening.

In his talk Mr. Lufburrow warned against cutting trees too young, and urged the same attention to young forests that is given the average business by its owner.

"There are three great industries connected with forestry, all holding a great future for Georgia", he said, listing them as the growing of timber for pulp, for naval stores and for lumber.

He commended the Slash Pine Forest Festival for its work in boosting all three of these industries, and asserted that "the forestry scheme sponsored by President

Roosevelt has put the forestry program in Georgia ahead fifteen years."

Friday, November 15, was Woman's Club Day. The Lyman Hall Chapter of the D.A.R., with appropriate exercises, and a well arranged program, unveiled a marker on the site of the historic Wildes Massacre. In this massacre, Maxwell Wildes, a frontier settler of Ware county, his wife and six children were brutally murdered by the Indians on July 22, 1838. Taking active part on this program were Mrs. Dan Lott, Hon. E. Knotz Bennett, Ruth and Alvin Wildes, descendants of the massacred family, the oldest son Reuben having escaped, Mrs. J. I. Brogdon, Hon. Braswell Deen, Mr. John M. Cox, Ordinary of Ware county, and Mrs. J. L. Walker, pioneer forestry promoter and Ware county historian.

The members of the Slash Pine Forestry Association, the citizens of Waycross and others who cooperated in putting on this festival are to be congratulated on the success of the undertaking. This project deserves the support of all who are interested in the better care of our forest resources.

MEMORIAL TO BONNELL STONE IN BRONZE

Tablet at Vogel Park Unveiled at Ceremonies Conducted by Georgia Forestry Association.

A bronze tablet was unveiled at Neel Gap recently as a memorial to the late Bonnell Stone, a founder and former secretary of the Georgia Forestry Association, and a former Georgia legislator of note, who died recently at Oxford, Georgia.

The tablet at Neel Gap, situated on the site of the New Vogel Park, the donation of which he inspired, bore the following inscription:

"Erected to the memory of Bonnell Stone by the Georgia Forestry Association of which he was a founder and secretary His public service as a trained forester merits him the distinction of being the father of forestry in Georgia. He inspired the donation of Vogel Park."

Tribute was paid to this eminent forester by T. G. Woolford, president of the Georgia Forestry Association; Judge Ogden Persons, of Forsyth; H. L. Kayton and W. T. Anderson, of Macon, Miss Emily Woodward of Vienna, C. F. Evans, assistant regional forester for the U. S. Government Paul Chapman of Athens; Tom Candler of Blairsville; Jack Lance, President of Young Harris College, B. M. Lufburrow, Georgia State Forester, and J. C. Kircher, United States Regional Forester.

After the dedicatory exercises, Mr. Woolford entertained fifty guests at lunch, and a meeting of the Georgia Forestry Association executive committee ensued in the afternoon.

See Photo on Page 4

SANTO DOMINGO STATE PARK IS FORMALLY OPENED TO THE PUBLIC

Deed of Gift Presented by Cator Woolford, Atlanta, Accepted for State by Governor Talmadge— Notables Attend Exercises.

The formal presentation to the state of the land on which Santo Domingo State Park stands was made by Cator Woolford, Atlanta, at elaborate exercises at the park on November 22. Mr. Woolford, in tendering this acreage to the state for park purposes, stated that it was his desire to preserve as much of the early history of the state as possible, and this section of Georgia was of most historic importance. Governor Talmadge accepted the deed and expressed the appreciation of the people of Georgia for so splendid a gift, not only for its value as a memorial, but as a recreational center.

Governor Talmadge is chairman of the Commission of Forestry and Geological Development, the Forestry Division of which administers state parks.

Mr. J. M. Mallory, Savannah, a member of the Commission, was chairman of the program committee, and Major W. L. Harwell, Brunswick, presided over the dedication exercises.

The program follows:

DEDICATION EXERCISES
SANTO DOMINGO STATE PARK
Brunswick, Georgia
November 22, 1935—10:30 A. M.
Major W. L. Harwell, Presiding

Music—Selected—Band.

Invocation—Rev. Jos. G. Callaghan, S. M., Brunswick.

Santo Domingo Park Site — What the Park Means to Coastal Georgia—Mrs G. V. Cate, Brunswick.

Cooperation of Emergency Conservation Work—Hon. Robert Fechner, Director E. C. W., Washington, D. C.

Cooperation by Army—Gen. George Van Horn Moseley, Commandant Fourth Corps Area, Atlanta.

Cooperation by Department of Interior —National Park Service — Conrad L. Wirth, Assistant Director, E.C.W., National Park Service, Washington, D. C.

Santo Domingo Park's Place in Georgia State Park System — Mrs. M. E. Judd, Chairman, Parks Committee of Commission, Dalton.

Music—Selected—Band.

Presentation of Deed to Santo Domingo State Park — Cator Woolford, Donor of park site, Atlanta

Acceptance — Governor Eugene Talmadge, Chairman, Commission of Forestry and Geological Development.

1:30 P. M.—Fish Fry for invited guests.

LOCAL COMMITTEE CHAIRMEN

Major W. L. Harwell, General Chairman. Finance, M. J. Welch; Fish Fry, Edo Miller; Grounds, Fernando Torras; Invitations, Col. T. L. Huston; Ladies, Mrs. K. G. Berrie, Military Affairs, Maj. H. T. Mayberry, Music, A. S. Kloss; Police, Chief Goodwin, Chief Register; Publicity, C. H. Leavy, Reception, Malcolm B. McKinnon; First Aid Station, Dr. Lovick W. Pierce.

AIRPLANES ARE USED ECONOMICALLY BY ALA- BAMA IN FORESTRY WORK

Mapping, Fire Detection and Other Forest Functions Are Materially Aided by Operation of Airplane.

That airplanes have long been used as an adjunct to forestry as well as to commerce and military operations is pointed out by the Alabama Commission of Forestry. It early was found that timber reconnaissance, general mapping, fire detection and a number of other forest functions could be aided and expedited through the use of airplanes with greater economy than in any other way.

The establishment in many of the states of official aviation boards has contributed greatly toward advancing all branches of aviation. State forestry departments using airplanes in their work thus find added co-operation available to them in carrying out the responsibilities best performed by aircraft. In Alabama, in particular, the action of the Legislature of 1935 in establishing such a board is viewed by the forest interests with strong approval.

Although some public forestal agencies use several planes the Alabama State Commission of Forestry has but one. The Commission's plane has been used in a great variety of forest work with a distinct saving in costs. In fire protection alone, after the use of an airplane was adopted it was found that it enabled the Commission to reduce the cost of the work by a net amount of approximately \$2000 a year above the expense of operating the plane. —Released by Alabama State Commission of Forestry.

THE IPS ENGRAVER BEETLES IN THE SOUTH (Continued from Page 1)

ble for the insects breeding up in large numbers. It often happens that trees are felled and the bark removed or burned after the insects which have attacked the trees have developed a brood and left the trees.

It is essential that all trees containing the living insects be treated. Some of these will still have green foliage or foliage that is only slightly faded, in which case boring dust or pitch tubes on the bark should be looked for as evidence of attack. When the foliage has turned brown, the insects have already abandoned the trees.

LYONS CLUB OF CLINCH COUNTY SPONSORS FORESTRY PROGRAM

Prominent Citizens Appear On Special Forestry Program at Homerville.

The Lions Club of Homerville was host on Friday night, October 18 to the teachers of Clinch County, entertaining with a banquet and a special program on forestry. The program was featured by addresses by Charlie Evans, Assistant U. S. Regional Forester, and Claude E. Boggs, Educational Director of the Georgia Department of Forestry.

The Homerville Lions Club has for sometime been vitally interested in forestry in Clinch county and in the state, and is now sponsoring through the schools of the county an educational program on forestry. This is the first club in the state to make forestry one of their major activities, and should be congratulated for the very large part they have played in making Clinch county one of the most "forestry-minded" counties in Georgia.

Forestry is included as a regular part of the curriculum of each Clinch county school, through the leadership of Mrs. S. C. Patterson, County School Superintendent, and the co-operation of the Lions club. Because of this, the children of Clinch county are becoming well trained in forestry, which is a real industry in this county, where forests are money crops, and 95 per cent of the land is in timber.

This program of forestry education, so beneficial to the county in which it is carried out was originated by two of the county's public spirited citizens, Mr. A. K. Sessions, of Cogdell, a member of the Commission of the State Department of Forestry, and Mr. W. M. Ottmeier, manager of the Superior Pine Products Corporation. These men have sacrificed time and effort in their co-operation with Mrs. Patterson, and the Lions club in putting across one of the finest forestry programs in the state of Georgia. These two gentlemen, Mrs. Patterson, the Lions club, and the teachers of Clinch county are to be congratulated.

Fred B. Merrill Honored

Fred B. Merrill, State Forester of Mississippi, was elected vice president and member of the executive committee of the National Association of State Foresters, which held its annual meeting at Montpelier, Vermont, early in October. Mr. Merrill was Assistant State Forester in Georgia from November, 1927, to August, 1929, when he was appointed state forester for Mississippi. His friends in Georgia are pleased to take note of this honor, and extend warm congratulations.

MORE OR LESS PERSONAL

The Forestry-Geological Review acknowledges with pleasure continued receipt of THE DIXIE RANGER, issued by the Regional Office of the U. S. Forest Service in Atlanta, and finds this publication full of interest.

It is noted that the November issue of the Central of Georgia Magazine, published at Savannah, Georgia, is printed on paper made from Georgia pines, and contains a very interesting article in regard to the splendid work of Dr. Herty.

Having no youngsters of their own, State Geologist and Mrs. Richard W. Smith have adopted an eight-months old baby girl whom they have named Anne Wellington. Anne is the first baby in the Georgia Geological Survey. The second is the little grandson of Mrs. E. M. Watkins, William Andrew McCullough, son of Mr. and Mrs. Claud McCullough, who arrived November 4th.

Mr. and Mrs. Edwin H. Sims announce the arrival of a daughter on November 14. This little lady bears the name Anne Bes-sellieu.

Mr. Sims is superintendent of State Park Construction.

There is just off the press a textbook on forestry titled "AN OUTLINE OF GENERAL FORESTRY" by Professor J. S. Illick, of New York State College of Forestry. We mention this because of the demand for a forestry textbook, and because this book is up to date, carefully prepared and arranged, and the statistical data it contains is accurate, and applicable to all sections of the country.

The readers of the REVIEW have been kept advised from time to time of the progress of Marion Renfroe of Quitman, Ga., in his experimental planting of pines and corn. We are very glad to note that Marion has been given a scholarship at the University of Georgia to study forestry. This scholarship has been awarded by the Georgia Forestry Association, in recognition of his unusual work.

In his work on his home project, Renfroe has a nursery of young seedlings and is now experimenting with the control of pine diseases. He contends that while the forestry interests are stressing the prevention of forest fires, two or three diseases that attack pines are a very serious menace and that preventive work should be undertaken while the pines are very young.

"It's a girl", Gene Bothwell announced on the morning of October 27th, and she will be called Mary Louise. Gene is architect in the Parks division of the forestry department.

FIRST DISTRICT

**T. P. Hursey, Dist. Forester,
ROME**

Well, folks, everything in district number one is on the up grade.

This district has six TPO's and nearly every one of them has a different system of fire suppression. For that reason a report is sent in by each TPO twice monthly to be studied by the district forester and the TPO secretaries. We expect to determine which method is the most "eco-effective" by the end of this fire season.

In order to give each county in this district its full opportunity in forestry, a form news article was written, in which blanks were left for the various factors. From the 1930 census their annual income was figured. Their possible income was figured from the number of forested acres and probable annual yield per acre.

Pictures have been shown by the extension forester from Athens at Ellijay, Canton, and Waleska.

The Martha Berry TPO has increased several thousand acres during the month October 18 to November 18, but none of it has been approved by the district forester yet due to the fact that it is rather scattered.

The Lookout Mountain TPO has increased a great deal, but much of the increase has not been approved as yet.

Ellijay TPO, is better fixed financially than any other in the district. A fire suppression plan has been inaugurated which

promises to get results under the efficient hands of Herman Pinson.

The Pickens-Dawson TPO has hired two men to canvass the two counties in order to get as many acres as possible in the unit before they burn over. They have agreed to use a fire suppression system similar to the Ellijay TPO, beginning December 1st.

THIRD DISTRICT

**S. L. McCrary, Dist. Forester,
Augusta**

T. P. O. Notes

The name of Green County TPO has been given to the organization formerly known as Woodville TPO. It is impossible to report the total acreage at the time of writing this report, as new areas are being signed up and other land owners have promised that they will come into the organization in the near future.

Middle Georgia TPO, with J. H. Balcom, of Jeffersonville, as temporary secretary is organizing. Meetings of land owners are being held and the importance of fire prevention is being stressed. We are able to report a nucleus of 8,000 acres in this organization.

Twiggs county has a standing reward for the arrest and conviction of fire bugs. Several land owners have offered personal rewards for conviction of anyone setting fire to the woods. The organization hopes to put on a patrolman as soon as funds sufficient for this purpose are available.



Tablet unveiled to Bonnell Stone, October 25, at Vogel Park

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester,
Savannah**

Tar City T. P. O.

The Board of Directors of the Tar City timber protective organization held a meeting recently and perfected plans to purchase a tractor and plow unit for use in maintaining primary firebreaks that have been constructed by the camp located in Reidsville. In addition to maintenance work the unit will be used in constructing secondary firebreaks on the protected area.

The Tar City T. P. O. covers lands in Tatnall and Toombs counties, and recently was extended to cover the lands in Evans county which lie west of the Canoochee river. The T.P.O. has a full time manager and all protective activities are under the supervision of the manager and all work is paid for on a per acre assessment basis.

Seed Collection

The quota of seed assigned to the Savannah district for collection has been gathered and are now in process of being cleaned. After the seed have been thoroughly cleaned we will have 550 pounds of slash, 350 pounds of longleaf and 100 pounds of loblolly pine. The seed will be used at the state nursery in Albany to grow seedlings to supply the ever-increasing demand for seedlings by land owners over the state. The seed crop this year was light as compared to last season, but they are unusually good and the percent of faulty seed is low.

E. C. W. Notes

Camp P-63 is making good progress on the towers they are building in Wheeler county. This is the third tower to be erected on the Ocmulgee TPO area.

As soon as final approval is obtained, a side camp will be established to finish the uncompleted work on the Liberty-Long area. The side camp will be located at the old site of Camp P-53 which was recently abandoned, and will use Camp P-82, Reidsville, as a base.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

T. P. O. Items

The Appling County TPO recently held its regular Director's meeting at the Baxley C.C.C. camp on the invitation of the Commanding Officer and Superintendent H. C. Brown. Congressman Deen and Mr. R. F. Burch, Jr., were present at this meeting and all were shown around the camp and had various phases of the work explained to them.

The Hurricane Creek TPO recently purchased a tractor and plow and has started operations. This TPO has never had any ECW work but is going ahead and planning its own protective system.

The Consolidated TPO is making plans to purchase a Radio broadcasting outfit to be used in fire protection work. This includes the central transmitter, six radio patrol cars, and fifty receiving sets to be installed in various trucks, cars, towers, private homes, and turpentine stills. This TPO has also already started building the TPO headquarters and dispatching center with the assistance of the CCC Camp at Homerville.

All TPO's in this District cooperated to put up an exhibit at the Forest Festival in Waycross and the exhibit was a real credit to their efforts and interest and drew much attention at the Festival. P. B. Copeland, Secretary of the Hurricane Creek TPO; J. M. DuPuis, Appling County TPO; L. F. Morey, Coffee-Jeff Davis TPO, and John Hanger, Assistant Secretary Coffee-Jeff Davis TPO, put up the exhibit.

The Suwannee TPO under the supervision of W. M. Ottmeier has a new plow for maintaining secondary breaks and it really makes a good clean break. Anyone interested can see the plow in operation at Bill's place in Fargo.

SOCIETY OF AMERICAN FORESTERS WILL HOLD ANNUAL MEET IN ATLANTA

The Society of American Foresters will hold its 35th annual session in Atlanta January 27, 28, and 29, 1936, the headquarters to be at the Ansley Hotel. The committee on arrangements is: Jos. C. Kircher, Chairman; B. M. Lufburrow, State Forester for Georgia and Chas. F. Evans of the U. S. Forest Service Regional Office, Atlanta.

Topics of current interest will be discussed on the program. Some of them are: Trends and Requirements for Newsprint Paper from Southern Woods, by C. P. Winslow of the Wisconsin Section; Educational subjects, S. T. Dana of Ann Arbor, Michigan; Land Utilization and Planting, Verne Rhoades of the Appalachian Section.

Gordon D. Marckworth, Head of the Forestry School of the University of Georgia will discuss "A Substitute for the N. R. A.", and C. F. Korstian of Duke University, Durham, N. C., is chairman in charge of committee reports, CCC activities, and will have as his subject for discussion, "Timber Stand Improvement."

The Annual Banquet will be held Tuesday evening, January 28, and field excursions will close the session on Wednesday afternoon, January 29.

Slash Pine Forestry Association

This association was organized just recently to promote the development of the forestry resources of the slash pine region. Its officers are K. S. Varn, Waycross, president; A. V. Kennedy, Waycross, J. K. Larsen, Hoboken, and A. K. Sessoms, Cogdell, vice presidents; G. M. Bazemore, Waycross, treasurer; J. S. Elkins, Waycross, secretary.

The directors are J. F. Adams, Nahunta; R. E. Benedict, Brunswick; W. S. Booth, Manor; Herbert Bradshaw, Waycross; Mrs. E. D. Dimmock, Waycross; Lindsey Grace, Screven; L. B. Harrell, Waycross; Dr. Chas. H. Herty, Savannah; J. H. King, Waycross; L. E. Mallard, Folkston; E. E. Miles, Baxley; R. M. Milliken, Jesup; W. L. Miller, Lakeland; M. M. Monroe, Waycross; W. M. Ottmeier, Fargo; J. A. Pearson, Alma; Miss Winifred Quarterman, Waycross; W. N. Smith, Waycross; W. G. Townsend, Waycross; Mrs. J. L. Walker, Waycross; R. B. Zachry, Waycross.

The association's first venture was to organize the Slash Pine Forest Festival at Waycross with the view of making it an annual event.

Further plans are now being considered for conducting a cooperative campaign in forestry development through the establishment of pulp and paper mills, livestock ranches and fish and game preserves.

The possibilities in the pine belt of the south are limited only by the effort that is properly applied to the development of its pine timber resources and the objective of this new association is to apply the effort.—Coastal Plains Journal.

IMPORTANCE OF FIRE PREVENTION

The oft-repeated caution in regard to keeping fire out of the woods is more important today than ever. As new uses are found for forest products the trees become more valuable, and it is therefore more important to keep out fires.

Every acre of forested land should be under fire protection. It is as necessary as fire insurance on your house or your automobile. There is also the advantage of having a portion of the expenditures refunded to every member of a timber protective organization.

Land owners, think this over.

The following table shows increase in acreage in the last 30 days:

Forestry District	District Forester	Old Acreage	Increase Last 30 Days	Per Cent Increase	Total Acreage in TPOs
1	T. P. Hursey	240,025	850	.3	240,875
2	W. D. Young	99,600			99,600
3	S. L. McCrary	33,370	9,930	29.7	43,300
4	W. G. Wallace	200,000			200,000
6	Jack Thurmond	758,608	42,000	5.5	800,608
7	R. D. Franklin	2,167,614	60,000	2.7	2,227,614
8	H. D. Story, Jr.	794,196			794,196
		4,293,413	112,780		4,406,193

FIRE PROTECTION PAYS.

A recent Service Letter issued by the Pennsylvania Department of Forests and Waters, contained the following essay entitled

"THE FORESTER"

"The forester is an amateur woodsman with a college education.

"There are two classes of foresters. One class believes in keeping abreast of those broad dynamic movements of the present day that challenge the best efforts of the nation's thinkers. The other class fights fire, builds truck trails, plants trees, and wears old clothes.

"Some foresters have offices, some live in Washington, and some work in the woods. Lots of foresters spend practically their entire lives in God's great out-of-doors. They love to hunt and fish. They would, too, if they only had time.

"It used to be said that a forester's best friends were his horse and his axe. Today a forester has no need for a horse, and he might cut himself with an axe. Years ago most every forester wore a big Stetson hat, and carried a gun on his hip and a flask in his pocket. Nowadays big Stetson hats are only worn in the movies, and you hardly ever see a forester carrying a gun.

"An interesting thing about a forester's life is that he meets all kinds of people from hobos to multi-millionaires. It is not uncommon for a forester to have the privilege of personally doing favors for a millionaire tourist. However, there is no record of a millionaire tourist ever doing a favor for a forester. But even if they don't make much money, it's nice, steady work and they have lots of fun.

"Another satisfactory thing about a forester's career is that he is his own master, absolutely independent and answerable to no one for his professional conduct. That is, except to his wife, ladies' garden clubs, sportsmen's associations, nature lovers, newspaper editors, and local politicians.

"Forestry is a very pleasant profession because it is so easy to get ahead. Many foresters graduate from college with only a few debts and immediately get a job and a wife. In about ten years time in addition to the same job and the same wife, they have more debts and five kids. That's why foresters are so happy."

Copied from PARK SERVICE
BULLETIN, U. S. D. I., Wash-
ington.

Pruning young timber is a direct and certain way to hasten the tree's process of producing clear knot-free lumber. Knots are cross-cuts of branches, and just as long as branches or branch stubs continue to stick out from the bole of the tree, so long will the wood added year by year remain a poor prospect for the sawyer.

SUGAR CAUSES BRILLIANT TREE COLORS OF AUTUMN

It's not an early frost, as commonly supposed, that produces the most colorful autumn leaves, says the United States Forest Service. It's a late frost—and the sugar in the leaf—that gives us the brilliant colors. Just the right combination of temperature and moisture is needed. The best colors come when the thermometer doesn't quite reach the freezing point for several weeks during the latter part of September and through October.

Silviculturists explain that before the leaves fall a layer of cells forms at the base of the leaf, which ultimately loosens the leaf, and, when it drops off, forms a scar. If frost doesn't arrive too soon, this layer forms early and quickly. It holds more sugar in the leaf and the sweet sap causes the brilliant reds and oranges and yellows that delight the eye. This is not only true of the gorgeous sugar maples in the north, but of most of the colorful hardwood trees—the oaks, elms, birches, other maples, sweet gum, black gum, hickory, dogwood, and many others. When frost comes too early the leaves dry and lose their sugar before they have time to take on high color.

NEW U. S. BULLETINS ISSUED

Available From Government Print-
ing Office at Small Cost.

Wood users of the United States will find information of value in two Forest Products Laboratory publications that are now available from the Government Printing office at small cost.

One, a handbook dealing with strength and related properties of woods grown in the United States brings up to date the tables and other material contained in Technical Bulletin No. 556 of the U. S. Department of Agriculture, and includes data on additional species. It is published as Technical Bulletin No. 479 of the Department.

The other, designated as Miscellaneous Publication No. 224, is a manual on the preservative treatment of wood by pressure. It is the first manual in existence covering the entire field of pressure preservative treatments, and contains numerous examples of practical applications that should be of value to engineers.

Rubber, Rosin, Gum Arabic, Myrrh, Gutta Percha, Copal, Dyes and Tans, Turpentine, Acetic Acid, Camphor, Cellophane, Explosives, Celluloid and Rayon—all come from various trees.

Fond Mommer: "Yis, Agnes be studyin' French and Algebra. Say 'good mornin'' to the lady in Algebra, Agnes."

A CHRISTMAS LEGEND

As the Christmas season approaches, it may be of interest to print a legend of the first Christ tree.

"It was Christmas Eve, long ago. Winifred, first Christian bishop of Germany, had seized an axe to destroy the ancient Thunder Oak, symbol of the great pagan god Thor, while around him the German people stood in awe.

A strong, whirling wind passed over the tree tops. It gripped the oak by its branches and tore it from the roots. Backward it fell like a ruined tower, groaning and crashing as it split asunder in four great pieces.

Winifred let his axe drop and bowed his head for a moment in the presence of almighty power. Then he turned to the people. "Here is the timber", he cried, "already felled and split for your new building. On this spot shall rise a chapel to the true God."

"And here", said he, as his eyes fell on a young fir tree standing straight and green, with its top pointing toward the stars, amid the divided ruins of the fallen oak, "here is the living tree with no stain of blood upon it, that shall be the sign of your new worship. See how it points to the sky. Call it the tree of the Christ-child. Take it up and carry it to the Chieftan's hall. You shall go no more into the forest to keep your feasts with secret rites. You shall keep them at home, with laughter and songs and rites of love. The thunder-oak has fallen, and I think the day is coming when there shall not be a home in all Germany where the children are not gathered around the green fir tree to rejoice in the birth night of Christ."

So they took the little fir from its place and carried it in joyous procession to the edge of the glade and laid it on the sledge. The horses tossed their heads and drew their load bravely, as if the new burden had made it lighter.

When they came to the house of Bundhar, he bade them throw open the doors of the hall and set the tree in the midst of it. They kindled lights among the branches until it seemed to be tangled full of fireflies. The children encircled it, wondering and the sweet odour of the balsam filled the house."

A stump of a giant cypress tree grown during the glacial era was uncovered by subway workmen Aug. 6, 1931, at Eighth and Locust Streets in Philadelphia. It was found 38 feet below the surface of the street and 10 feet below sea level. The stump measured 17 feet in circumference.

The November meeting of the Georgia Mineral Society at the State Capitol, was the largest meeting of the group held to date. Approximately thirty persons were present. William B. Pitts addressed the society and displayed his gem exhibit.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE BLEACHING CLAYS OF GEORGIA

By

Harry X. Bay and Arthur C. Munyan

Published by permission of the Director,
U. S. Geological Survey

ARTICLE III

Oligocene (Flint River) Clay

The Oligocene Flint River formation^[1] of Georgia consists principally of bright-red clayey sand, with which are associated beds of iron-stained, more or less sandy clay, that is pale-green to greenish-gray and light-gray, unctuous, plastic to hard and brittle or soft and mealy. This material is a naturally active bleaching agent for oils, as well as being itself activable. In activability the Flint River clay is somewhat similar to the Ordovician bentonite found in the northwestern part of the State. Although no volcanic ash structures have been reported from this material, its appearance and acid activability suggest a derivation from volcanic ash, and it is possible that this zone is correlative with the extensive bentonite zone in the Oligocene of Mississippi and elsewhere.

Several exposures of Oligocene bentonitic (?) clay were visited by Mr. Bay during the initial survey. He noted the occurrence of beds near Cordele, Crisp County; Montezuma, Dooly County; Oglethorpe, Macon County; and Americus, Sumter County. In the later investigation by Mr. Munyan a great many more exposures were located, but most of them are of no commercial interest at present. There are two, however, which may be worthy of attention—one east of Americus and the other northwest of Vienna, in Dooly County. The time available permitted only a very hurried survey of the clays in the Flint River formation, and it is possible that further examination will disclose beds that are extensive enough and activable enough to support commercial development. It is thought that a thorough investigation of the Flint River outcrop is warranted by the data now at hand. The formation extends southwestward from the Oconee River in Laurens County across Pulaski, Dooly, and Sumter counties, where the outcrop divides. One tongue roughly follows the course of the Flint River in a narrow belt across Crisp, Dougherty, Mitchell, Grady, and Decatur counties, and the other tongue trends southwestward in a broken belt of outcrops through Terrell, Randolph, Cal-

houn, and Early counties. The most extensive outcrops of the formation are in the upland areas of Pulaski, Dooly and Sumter counties, and it is here that prospecting is likely to prove the most fruitful.

Miocene (Hawthorn) naturally active clay

The Miocene Hawthorn formation in Georgia has never been formally described under that name. Veatch and Stephenson's^[2] Alum Bluff formation and Marks Head marl and part of their Altamaha formation^[3].

The Hawthorne formation in Georgia is generally light-colored. It contains much fine sand mingled with white clay. Coarse sand and angular gravel are also common, and parts of the formation are hardened to sandstone. Associated with these sands and clays are extensive beds of drab, gray, and greenish-gray fuller's earth, and mottled gray and tan bentonitic (?) clays.

The Hawthorn formation occupies a broad hilly belt (Tifton upland or "wire-grass region") that extends from the Florida line to Waynesboro and lies between the lowlands bordering the Flint River (Dougherty plain) and the coastal terraces. It underlies the terrace deposits and is exposed in some of the valleys that cut through them.

The fuller's earth in the Hawthorn formation is light-gray to greenish gray, unctuous, hard and brittle. The fracture is either hackly or conchoidal. In many places where the overburden is thick the earth contains lenses of hard clayey limestone and small masses of crystalline calcite. The bleaching-clay bed is usually directly overlain by a thin bed of gray or bluish-gray plastic, gumbolike clay ("short-bread").

The fuller's earth of the Hawthorn formation differs from that of the Barnwell formation in that for the most part its bleaching efficiency is not affected by acid treatment. An exception was noted near Ochlocknee, in Thomas County, where samples of the Hawthorn from a bore hole proved to be truly activable. In many occurrences the plastic "short-bread" that overlies the true fuller's earth is activable to a degree approaching that of the Ordovician bentonite of northwestern Georgia.

The fuller's earth beds in the Hawthorn formation of southwestern Georgia support the most extensive bleaching-clay operations within the State. At the present time deposits in Decatur County contribute an appreciable part of the total world production of fuller's earth. Large deposits of

naturally active clay of commercial grade occur in northcentral Thomas County and to a lesser extent in Grady County. These deposits constitute valuable reserves, and should the beds now being mined become depleted or should the market be expanded, Thomas and Grady counties would be in line for commercial development.

The later investigation by Mr. Munyan showed the presence of considerable activable clay in the Hawthorn. The exposures that yielded the most promising material are, in Grady County, a few miles east of Cairo and just north of the Florida boundary; in Brooks County, in the southeast corner, just west of the Withlacoochee River; and in Colquitt County, several miles west of Moultrie.

SUMMARY

Bleaching clays are known to occur within five geologic formations in Georgia—the Ordovician Chickamauga limestone, the Eocene Midway formation, the Eocene Barnwell formation, the Oligocene Flint River formation, and the Miocene Hawthorn formation. Both naturally active and activable clays are represented.

Inferior activable clay occurs in the Chickamauga limestone in Chattooga, Dade, and Walker counties. The commercial possibilities of this clay are doubtful.

Naturally active clay is found in the Midway formation in Stewart County, but it is not sufficiently active to compete with present-day commercial clays.

Extensive beds of clay occur in the Twiggs clay member of the Barnwell formation in Crawford, Houston, Jones, Twiggs, Washington, and Wilkinson counties. Fuller's earth is being produced from beds at this horizon in Twiggs and Wilkinson counties. This clay is activable as well as being naturally active, and locally it may be sufficiently activable to justify acid treatment.

Bentonite-like clays are found in the Flint River formation in Crisp, Dougherty, Dooly, Macon, and Sumter counties. These materials are activable, and certain beds may meet commercial requirements.

Extensive deposits of high-grade naturally active clay are found in the Hawthorn formation in southwestern Georgia. These beds support large commercial bleaching-clay operations.

Activable clay that may prove, with future work, to be of commercial value, has also been discovered in the Hawthorn.

¹The Deposits of Vicksburg (Oligocene) age in Georgia and adjacent regions, formerly correlated with the Glendon limestone of Alabama, are probably somewhat younger than the typical Glendon and have recently been named "Flint River formation" by C. W. Cooke (Am. Assn. Petroleum Geologists Bull. vol. 19, p. 1170, August, 1935).

²Veatch, Otto, and Stephenson, L. W., *Geology of the Coastal Plain of Georgia*: Georgia Geol. Survey Bull. 26, 1911.

³Cooke, C. W., Oral communication.

COLUMBUS HIGH SCHOOL PRAISES MINERAL MUSEUM

"Division of Geology,
425 State Capitol,
Atlanta, Georgia.
Gentlemen:

I wish to thank your department for the interesting collection of minerals, rocks and clays received here at the Columbus High School earlier in the fall. There are seventy-five specimens, the same number of block mounts, identification cards and several descriptive booklets. Everything was so well packed and marked that it was a pleasure to set them up for display.

I am sending a photograph of the display under separate cover. In this case the cabinet is opened on one side to offset the light reflections of the camera. Otherwise the cabinet is kept closed and secured with screws. The bottom of the cabinet door does not hide any of the displays as it may seem from the photograph. When closed enough to read the cards, everything shows up clearly.

This collection is creating a great deal of interest, especially to the science group, and is quite a desirable addition to the department. I intend to call special attention to it on any occasion when visitors come to the school.

We appreciate very much your loan of this collection and shall see that it is properly taken care of, that is, studied as a museum display and not handled.

I wish to acknowledge here the cooperation of Mr. Walter Pike, secretary of the Chamber of Commerce, in securing this collection for us. I have personally talked with him and expressed my thanks.

Yours very truly,

G. N. THOMAS,
Science Department,
Columbus High School."

PITTS' COLLECTION OF GEM STONES ARE ON DISPLAY AT CAPITOL

A temporary exhibit of over two thousand and beautiful specimens of cut and polished gem stones, petrified wood, and colored stones from all over the world will be on display during November and December in the State Museum on the fourth floor of the State Capitol, according to the State Geologist, Mr. Richard W. Smith. These stones were all collected, cut and polished by Mr. William B. Pitts of Sunnyvale, California, formerly of Atlanta. Mr. Pitts, who is now visiting his brother, Mr. Thomas H. Pitts, of Casa Loma, Cascade Road, became interested years ago in collecting and cutting stones as a spare time hobby. Since his retirement from business several years ago he has devoted his entire time to this work and has become one of the foremost amateur collectors and lapidarists in the country. Most of the mineralogical mu-

seums of the United States contain specimens of his work and he has given large collections to the Academy of Sciences in San Francisco and to the State Capitol at Boise, Idaho. A small but beautiful collection, donated several years ago to the High Art Museum, has attracted the attention of many Atlantians.

The present exhibit at the Capitol is not a traveling exhibit but was brought by Mr. Pitts to show to his numerous Georgia friends and to stimulate an interest in his native State in the collection and polishing of stones as a hobby. It features a uniformly mounted educational exhibit of 80 gem stones, an especially beautiful collection of rough and polished opals, and several transparent slabs that resemble natural landscape views.

Hundreds of school children and other visitors have already availed themselves of the opportunity to visit the Pitts collection of gem stones now on display at the State Capitol. School superintendents in the Atlanta area have urged their students to see this unusual exhibit.



Cabinet for display of museum of the common rocks and minerals of Georgia-Columbus High School, Columbus, Ga.

FROM A GEOLOGIST'S NOTEBOOK

The school museums of Georgia rocks and minerals which are being distributed by the Division of Geology have already been sent to a number of schools. Other sets are being held at the Capitol pending the delivery to some representatives of schools who are to call for them. A total of eighty sets have already been prepared, each set containing seventy-five specimens, mounting blocks, labels, and literature. Enthusiastic acknowledgements are being received daily. A letter from the Columbus High School is reproduced in this issue along with a photograph of their cabinet and mineral set.

Night prospecting with an ultra-violet lamp revealed considerable uranophane and hyalite on some of the granite at Stone Mountain. G. W. Crickmay, Lane Mitchell, and Wm. Pitts obtained a number of excellent specimens on a recent trip to the mountain. Although of no commercial importance, these minerals are of interest because of their brilliant fluorescence under ultra-violet rays. Uranophane is well known for its radio-active properties. Some of the specimens will be displayed in the State Museum under a lamp now being assembled for that purpose.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 6

ATLANTA, GA., JANUARY, 1936

No. 1

FORESTRY AND CONSERVATION

By LUTHER F. ELROD, Extension Agent
Soil Conservation Service

Since the first white man set foot upon the shores of what is now the United States, to the present time, we have gone through five periods of development, or rather we have gone through four periods, and are now entering upon the fifth.

These periods, for the want of better terms, may be called the periods of exploration (1492-1607), occupation (1607-1733), exploitation (1733-1920), confusion (1920-1933), conservation (1933-.....).

The first period began when Columbus discovered America in 1492, and lasted until the first permanent settlement was made in 1607. This period of exploration was entered into by many of the nations of the eastern world.

The same year that Ponce de Leon was exploring the "land of flowers" to our south in 1513, another Spaniard, Balboa, was exploring the great western lands and the Pacific Ocean. A few years later another Spaniard, DeSoto, made a trip to Florida, Georgia, South Carolina, Alabama and on to what is now Mississippi, exploring the land and discovering the great Mississippi river, which was to be his final resting place.

In the meantime a Frenchman, Cartier, was exploring the lands adjoining the St. Lawrence, and Sir Francis Drake, an Englishman, was exploring the great northwest. There were other expeditions and explorations from time to time, but the ones mentioned above are the major ones.

Then came the period of occupation from 1607, when the first permanent English settlement was made at Jamestown in 1607, until the last of the original colonies was settled in 1733. From here on we are concerned mainly with the last of the colonies to be settled, Georgia.

From the time Georgia was first settled until 1920 it was a period of exploitation of her natural resources. I do not mean that this exploitation was always used detrimentally,—it was not—but too often it was.

When the state was first settled every hillside was covered with magnificent trees, of pine and hardwoods, that reared their stately heads above the surrounding landscape. One could travel for hundreds of miles on the forest floor and never get from under the shadow of these stately trees, so close together were they that their boughs often interlocked. Beneath the forest floor was a rich virgin soil that had been thousands of years in forming. The Indians living as they did, mostly by hunting and fishing, had scarcely marred the landscape. They only killed for a meal, and never for pleasure or sport. When they had killed a bird or an animal or felled a tree for a canoe, they left all the rest for another day.

But when the white settlers came they began to clear the forests and to kill the game. They used some of the trees to build homes, barns and fences, but many, many of them they piled in great heaps and burned. They would cultivate the land for a while, and as soon as the fertility was gone from one field, the farmer would move over to another field and repeat the same process, thus destroying needlessly acres of fertile soil and forests of fine trees, but at the same time the farmers were building up a new nation of fabulous wealth. The over-crowded population of Europe came to the new world in great numbers. Frontiers were pushed farther and farther westward at such a rapid rate, that no attention was given to a careful land use planning that would have protected our rich natural resources. The early settlers thought this new land contained an inexhaustible supply of timber, and rich fertile soil. But already we have well nigh exhausted both, and unless a wise land use program is followed, we will in the very near future feel keenly the loss of these. In fact we are already feeling it in the small returns from submarginal farming.

"Confronted by apparently limitless re-

(Continued on Page 2)

TURPENTINE GUM A CASH CROP FOR THE FARMER

By K. S. TROWBRIDGE,
Cooperative Agent on Naval Stores, Bureau
of Chemistry and Soils, U. S. Dept.
Agriculture, and Georgia Ex-
tension Service.

The production of pine gum by farmers in the Georgia naval stores territory as a cash crop is a relatively new development. It was accentuated by the Depression, when agricultural commodities and general farm cash crops were selling at less than the cost of production. The farmer in the Georgia naval stores territory turned to his naval stores timber for a cash income to supplement and maintain his normal farm program.

In the year 1930 there were probably not more than three or four hundred individuals in Georgia who engaged in the practice of working their own turpentine timber and selling the gum as a cash crop.

The Southern Forest Survey, conducted by the United States Forest Service, on November 1, 1934, and on May 6, 1935, published its findings on "Gum Naval Stores Production" in Unit 1 and Unit 2 of Georgia, Unit 1 embracing thirty-five counties in Southeast Georgia, and Unit 2 embracing twenty-two counties in Southwest Georgia. The survey showed that at these respective times there were 7,854 farmer gum producers in Southeast Georgia and 325 farmer gum producers in Southwest Georgia.

In the naval stores season of 1934 farmer gum producers, according to The Southern Forest Survey, accounted for a naval stores production of 62,151 units of naval stores. This is equivalent to more than 300,000 fifty-gallon barrels of dip, or gum. The average value of a barrel of dip is estimated to have been at that time approximately \$5.00 per barrel, which would make a total gross income to the farmer for this gum in excess of \$1,500,000 for the 1934 naval stores season.

It is interesting to compare the status of gum production in the Southeast and Southwest sections of Georgia. Thirty-five Southeast Georgia counties in 1934 had ap-

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

FORESTRY AND CONSERVATION

(Continued from Page 1)

sources, there developed in the minds of the colonists and succeeding generations an attitude to develop and exploit the timber and soil as rapidly as possible with little regard for the consequences", says Dr. W. C. Loudermilk, Associate Chief of Soil Conservation Service.

There was ever the lure of large gains at low costs and with comparatively little effort. This early belief in the limitless expanse and resources of the new found continent has persisted too long and played a disastrous role in the wasteful practices of our timber and soil resources, until it has become a menace to the future welfare of the nation.

This wasteful practice has had a new ally in recent years, in the saw mill man. The fires that he started, and other careless citizens, have been a great menace to our timber lands. Our timber resources are being destroyed many times as fast as they grow. Fires alone destroyed approximately \$4,500,000 in timber resources in Georgia last year.

Some one has truthfully said that, "The soil and timber resources belong to posterity and not to the present generation alone. The possession therefore is a sacred trust, and unless used in accordance with that idea we are heading for serious trouble in our own day and are fore-dooming the coming generations to poverty and want. We, therefore, have no right to abuse this sacred trust but should pass it on in better condition than when we found it."

In 1920 the boll weevil began its wholesale destruction of cotton, and reached its climax in 1922 when the loss was so great that the financial structure of the whole region, which is directly connected with agriculture, was threatened. This was the period of consternation and confusion and lasted until 1933.

Farm mortgages in Georgia had jumped from \$28,000,000 to \$101,000,000, according to Mr. Loy E. Rast, Director of Soil Conservation in Georgia. This was due largely to the clearing of the land and the destruction of the timber which permitted severe erosion to gain tremendously during this period. A recent survey by the Forest service, shows that four-fifths of the land, in the Piedmont region of Georgia, has been cleared for farms, but only 22% is now growing agriculture crops. Severe erosion that rendered the land physically unsuited to farming is the chief reason for this abandonment. A recent erosion survey of Georgia showed 58.8% of all the land of Georgia, exclusive of large cities and water to be affected by erosion. 42.3% of this land has lost from one-fourth to three-fourths of its top soil.

There is only one acre of fertile top soil left for each inhabitant. There is another acre of slightly eroded land, five acres of badly gullied and badly washed land, and six acres of mountain, marsh and swamp land.

Realizing this deplorable condition of our soils and timber land, Congress in September, 1933, set aside a sum of money for demonstrational and educational projects in each of the several states of the union. The object of these projects is to show the farmer how to conserve this fertile acre, and bring back as far as possible these six acres of eroded land. Some of the methods used in doing this are reforestation, strip cropping, contour farming, terracing, baffle dams, retiring to pasture, etc.

Last season the Soil Conservation Service planted 2,500,000 seedlings and this season they expect to plant 18,000,000. These will be planted on the Sandy Creek area at Athens, the sub-projects and the camp areas. These trees will be furnished by the Soil Conservation Service from their plant nurseries, and by the ECW.

It is not too visionary to say, that if the people of Georgia, all the people, will follow a wise land use program, in another generation, her hills will again be covered with valuable forests, her meadow lands will pasture fat cattle—her streams will again run clear and again be filled with fish—her woods will be filled with abundant game, and painted well-built homes will adorn every farm. These homes will be filled with happy and contented people who will not only make a living from fertile farms, but enough more to give them the pleasures and luxuries of life to which they are rightly entitled.

CULTIVATION OF THE TUNG OIL ORCHARD

H. P. STUCKEY, Director
Georgia Experiment Station,
Experiment, Ga.

In order for any tung oil planting to be of the greatest possible value the trees must be healthy and able to make their maximum amount of growth. This depends largely upon the care given the trees, especially during the time when they are becoming established in the soil.

For the first two or three years after the young trees have been set out they should be cultivated often enough to keep down the growth of grass and weeds and to prevent the soil from becoming packed around the slender fast growing trunks. Because of the shallow root system of the trees, however, cultivation must not be deep enough to damage the many fibrous feeding roots which are found for the most part within approximately a six-foot radius of the tree base.

Perhaps the most common practice among tung oil growers is to plant some leguminous cover crop, such as crotalaria, cowpeas, or soybeans, between the rows of trees during the spring, and turn it under before frost in the fall. Although frequent cultivations are not as important in the older orchards it is thought desirable to clean from under the trees of four to six year old plantings at least once during the summer. As the trees mature the shade from the heavy foliage reduces the weed growth to the extent that intensive cultivation near the trees is unnecessary.

Results of merit have been reported from mulching the growing trees with straw and tung nut hulls. The mulch in all probability aids in tree growth and productivity by increasing the organic matter content and water holding capacity of the soil.

In some recent chemical analyses, made by the chemical laboratory of the Georgia Experiment Station, it was found that tung fruits of high average oil content and apparently good quality can be grown in Georgia. Twenty-seven samples of nuts from Cairo, in Grady County, Georgia were analyzed for oil content and found to contain from 58.40 to 67.93 per cent oil in the kernels or meats, oven dry basis, and from 15.99 to 24.64 per cent oil in the whole fruit, air dry basis.

The tung oil tree is very easily injured by cold weather. It is therefore advised that commercial plantings be confined to the Coastal Plain section of Georgia, preferably in the extreme southern part. It is to be remembered that a good well drained light soil, preferably of a slightly acid nature, and good cultural practices count with the tung oil orchard as in the culture and care of other orchard crops.

FARM FORESTRY FROM THE COLLEGE STANDPOINT

It has been said that the place to learn farming is behind the plow. This may not be wholly true, but the fact remains that in any profession one must have practical experience in the skill and art of accomplishing jobs pertaining to that profession, and that this skill cannot be learned from books alone.

With this in mind, the Board of Regents created the Abraham Baldwin Agricultural College in 1933, to give Georgia farm boys and girls a chance to learn better farming methods and at the same time gain actual experience in performing the jobs necessary to successfully complete any of the several farm enterprises.

Since farmers cannot afford an expensive education, expenses are held to a minimum. Aside from offering a strong curriculum in practical work, stressing the art as well as the science of farming Abraham Baldwin strives to create in the students a desire to return to rural Georgia and lead more wholesome and satisfying lives on the soil, putting into actual practice the better methods learned.

Abraham Baldwin is not a preparatory school, but rather a terminal college, the success of which will depend upon the success of its students in farming.

Since forestry is an important part of a successful farm, and because of popular demand of the students, a course of practical instruction in farm forestry was included in the regular curricula in 1934. Like other phases of work given at Abraham Baldwin, forestry is built around present day needs of Georgia farmers.

It is generally conceded that 90 percent of our forestry problems center around private forestry, and that Georgia has such possibilities in private forestry as to make the creation of federally owned national forests in the state undesirable. Forest schools training men for the United States Forest Service has not helped the condition of private forestry in the South.

At a meeting of prominent foresters in Lake City, Florida, two years ago, much talk was made of forestry in general and fire protection in particular, yet during the meeting, at least half the timberland along the highway between there and Valdosta and Waycross was burning over. More foresters are needed on the soil growing trees.

According to the Georgia Experiment Station, more than 37,000 farms in the state are definitely submarginal, and that approximately two-thirds of the land area of Georgia is unsuited to cultivated crops. Indeed forestry is an important part of farming in Georgia.

Forestry instruction at Abraham Baldwin is centered around farm forestry, and consists of three general groups of study:

1. Protection and improvement of existing stands of timber.
2. Reforestation, land classification and land use.
3. Production, Utilization, measurement and sale of forest products typical to Georgia's woods.

Practical experience is given in all phases of farm forest management in the handling of the forests of the Coastal Plains Experiment Station, adjoining the college, where thinning, improvement cuttings, selection cuttings and fire protection are all practiced. A small forest nursery is operated by the students in connection with the college, where slash pine seedlings are grown for sale to farmers.

To illustrate the thoroughness of work given in forestry, in operating the slash pine nursery, students gather, clean and store the seed; select and prepare nursery sites, plant and care for the seed beds, and gather and pack the seedlings for shipment. All this is supplemented by class room exercises and the reading of all available literature on the subject by each student. This same procedure is true with other phases of the work.

In view of the fact that the number of farmer gum producers in Georgia has increased from around 200 in 1930 to over 8,500 in 1934, instruction in naval stores is stressed. K. S. Trowbridge, naval stores co-operative agent, and consultant forester of the college gives assistance in naval stores work at the school.

Two one week camps are held during the second year. One near Brunswick, Georgia, through the courtesy of the Brunswick Peninsula Co., where the students plant and thin large areas, gain experience in timber estimating and naval stores work, and visit various forest industries in that vicinity. The other camp is held on the Osceola National Forest in Florida, where all phases of forest management on a large scale are observed.

Throughout the course of instruction, the place of forestry on the farm is clearly shown, either as a secondary enterprise or as a major activity, as would be the case in the southeast portion of the state.

This year there are 24 second year men electing advanced forestry. All first year men are required to take one course. It is noted that those students who hold vocational forestry certificates from the Georgia Forest Service, are usually leaders in the class. The school is not trying to train men to go out and look for salaried positions in competition with graduates from four year forest schools, but to train men who, when they return to the farm will know how to grow successive full crops of timber on areas unsuited to cultivation, and know how to intelligently utilize and sell the products derived from that timber.

GEO. W. MOSELEY, Forester,
Abraham Baldwin College.

AN APPRECIATION

A recent mail brought to the desk of the REVIEW editor, a copy of a brand new publication, CAMP BERRY BREEZE, published by Company 3435, Camp Georgia P-87, CCC, Rome, Georgia. That the name of this publication is eminently fitting is evidenced by the "breezy" items it contains.

A beautiful tribute is paid to Miss Martha Berry, and the REVIEW takes pleasure in reproducing in this issue the photograph of Miss Berry which appeared in Camp Berry Breeze. Miss Berry's work is briefly recounted in the BREEZE, and it is observed that she has endeared herself to the boys in Camp P-87 by her personal contacts with them and her interest in their work. Long live Martha Berry!

It is noted that Forestry subjects hold the attention of the readers of BREEZE from several vantage points in this issue. Likewise that sports, personals, including a marriage notice, poetry, and well placed ads give to this paper a smart, up-to-dateness, seldom seen in a non-professional publication. We note that the editors have borrowed "There Ought to be a Law" column from another publication, and applied it locally. The editorial page is a credit to this high class publication, and the REVIEW congratulates Editor Williams and his staff on such an excellent paper.

Another publication which has attracted the attention of the editorial staff of this paper is the MERIWETHER TRI-C NEWS. This is a monthly publication by members of Company 1429, CCC Camp SP-7 at Warm Springs. The December 1 issue contains a most interesting article of President Roosevelt's visit to Warm Springs. The boys of the camp were in the welcome guard that met the president's train upon arrival, and aided the Marines who were on duty by offering the facilities of Camp Meriwether for their use.

This issue is full of newsy tidbits, but the items about food rations and the Thanksgiving menu shows that the boys in Camp 1429 uphold the tradition in regard to man and his food. It reminded this editor of a paragraph in another paper, which ran like this:

Lieut.—I hope you're doing what you can to economize on food.

Mess Sgt.—Yes, sir, we've put the cat and her kittens on milk and water.

No economizing for the boys, and personally, we don't blame them.

There are other features that attracted favorable attention, and we hope the circulation department of the Tri-C News will continue to place the Forestry-Geological Review on their mailing list.

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ESSAYS ON FORESTRY REVEAL INTEREST OF VOCATIONAL STUDENTS IN SUBJECT

As a part of the school work, the teachers of vocational agriculture have had their students to write essays on the subject of forestry, and the Review plans to use the best of these papers.

The one reproduced here is by Robert Hendrix, a senior student at Gore High School, a school teaching vocational agriculture at Gore, Georgia, in Chattooga county. Mr. C. H. Barker is the teacher.

This was used in a district F.F.A. speaking contest, and is titled:

"Outlook of Forestry"

Trees are all a part of our lives, our happiness and our comfort.

When the Indians roamed this country, there were 822,000,000 acres of forested land. Much of this has been cut for farms and cities as the population has grown. It is now estimated that we have 91,000,000 acres of untouched forest, and 84,000,000 acres of land, fit for nothing but growing trees, which should be reforested to produce an ample supply of timber to meet our demands each year.

Due to cutting for our needs and to destruction by forest fires, our forests are going faster than they are being replaced.

Everyone should know the damage of forest fire. First, it kills seed and seedlings; second, it destroys plant food, and in so doing starves trees and retards their growth; third, it scars and weakens trees, thus favoring attacks of rot fungi and insects; fourth, it reduces the ability of the soil to absorb and hold enough rainfall to make rapid growth; fifth, it promotes the quick run-off of rainfall, thereby increasing destruction by floods; sixth, it causes erosion and loss of soil fertility; seventh, it destroys the best pasture grasses; eighth, it destroys food and coverage of game.

We have been told of the man who put a lock on the barn after the horse was stolen. The United States is likely to find itself in the same predicament in regard to forestry. If we give thought to the future of our country, we must map out a plan of growing timber crops close to where forest crops are most needed. Unless we improve our methods of handling our forests, there will come a time when we shall have no forests left.

William G. Greely, former Chief of the United States Forest Service, called the situation "A predominant issue". He added, "The solution is plain; all forest lands must grow timber crops."

What will it mean to our state and national prosperity when industries have to slow down and cut payrolls because of the high cost of forest products?

We think of California as one of the states of uncut forests, yet even that state uses more than it produces. This should be of vital importance to every person in our

nation. Yet there is a chance for recovery of prevailing conditions. Opportunities for forestry in southern agriculture have advanced somewhat the past year. During that time there has been a greater change in agriculture than in the preceding century. This change has been brought about by a national plan for economy in forestry, which, embodied in provisions of the National Industrial Recovery Act and the Agricultural Adjustment Administration, has distinctly enlarged the southern farmer's opportunities for profit through management of his woodland.

The code of fair competition for the lumber industry sets up several kinds of restrictions for sawmillers and manufacturers using forest products. Among other things, it sets specific minimum prices at which finished products can be sold, thus enabling the manufacturer to pay more for timber than he has been paying. So far as the future markets for wood products are concerned, owners of timberland are justified in expecting that their opportunity will not diminish. Thus we see that the codes on wood products and good forest management, on the part of timberland owners, are contributing to his annual profit from his forest.

In the field of forest utilization, the farmer's job is not so difficult. Instead of clean cutting his salable timber, he should practice selective cutting and thus get a continuous income. Ordinarily, selective cutting costs nothing aside from the owner's time, and its returns continue from year to year. An owner can well afford to pay taxes on managed forest land that is highly productive and is returning a profit on the investment. This phase may be vague to some, but it is pertinent—"Why not a timber crop every year?"

Every organization should be enlisted in a campaign that gives a place on its pro-

gram to discussion of a timber crop every year.

More attention must be paid to the welfare of trees, and since they cannot speak for themselves, someone must speak for them. To voice their cause is to speak for the economic future of the country.

Trees will amply repay all that is done for them.

Aside from the economic value of the forest, may we too see the beauty of trees, as did Joyce Kilmer, who wrote of them:

"I think that I shall never see

A poem lovely as a tree.

A tree whose hungry mouth is pressed
Against the earth's sweet flowing
breast!

A tree that looks at God all day,
And lifts her leafy arms to pray.

A tree that may in summer wear
A nest of robins in her hair;

Upon whose bosom snow has lain,
Who intimately lives with rain.

Poems are made by fools like me,
But only God can make a tree."

TURPENTINE GUM CASH CROP

(Continued from Page 1)

proximately 8,500 individuals engaged in gum production as compared with twenty-two counties in Southwest Georgia having a total of only 359 such individuals. It would appear, therefore, that turpentine gum in certain sections of Southeast Georgia is the farmer's main crop and that other farming operations become merely those of subsistence, supplying his family and livestock with food and feed. In Southwest Georgia cotton, peanuts, tobacco, hogs and other cash crops occupy the farmer's time chiefly, while gum farming is simply a side issue giving him a supplementary farm income.

The question has been raised by a good
(Continued on next page)

MARTHA BERRY



(Continued from Page 4)

many naval stores operators as to whether the farmer in Georgia will continue to gather and sell gum from the timber on his farm or will abandon this activity when his customary farm operations become more profitable.

Farmers can easily work a half crop, or 5,000 faces, of naval stores timber with some help from his regular farm labor or members of his family and at the same time produce enough food and feed to meet the requirements of his family and livestock.

One-half crop of turpentine timber ten inches and larger, and of fair quality, with good work and care should yield about 125 fifty-gallon barrels of gum per season. The farmer's income from this quantity of clean gum free from trash and water, at \$4.00 per fifty-gallon barrel would be \$500.00 per season, and of course would be more at higher prices.

The cost of production would be relatively small after the initial investment in cups, aprons and tools. Using a good quality of equipment the total cost for cups and other necessities would probably not exceed \$350.00. This same equipment would last four years or more depending upon which kind of cups and gutters are used. By conservatively working his timber each face can be worked at least six or seven years.

Recent analysis of three samples of gum taken from commercial naval stores operations and analyzed by the Bureau of Chemistry and Soils Naval Stores Station, Olustee, Florida, gave the following results and show how receipts from these gums differ.

The first sample made rosin of X grade containing 75.1 per cent rosin, 22.4 per cent turpentine, 0.5 per cent trash and 2 per cent water. Rosin and turpentine distilled from a 50-gallon barrel of this class of dip was worth \$14.23 at Jacksonville on November 5, 1935.

The second sample made WG rosin containing 67.7 per cent rosin, 20.3 per cent turpentine, 4 per cent trash, and 8 per cent water. Rosin and turpentine obtained from a 50-gallon barrel dip of this class was worth \$11.60 at Jacksonville on November 5, 1935.

The third sample gave resin of M grade. It contained 59.5 per cent rosin, 17.5 per cent turpentine, 8 per cent trash and 15 per cent water. Rosin and turpentine from a 50-gallon barrel of this dip was worth only \$9.37 at Jacksonville on November 5, 1935.

There is a difference, then, in the value of the products from a 50-gallon barrel of gum of \$4.86 between samples one and three. Such gum as represented by the third sample is usual rather than exceptional.

It is easy to see, in view of this analysis, that good, clean gum will pay the farmer more because it is more valuable to

the stiller than is poor gum with high trash and water content. One large gum buyer in Georgia is now buying gum by weight and grade and paying accordingly for it.

One accustomed to doing so can usually judge correctly the grade of rosin that can be made from a particular barrel of dip if he follows the directions of the Bureau of Chemistry and Soils Naval Stores Station in judging gum. Selling by weight is much more satisfactory than selling by measure both to the farmer and the stiller. Barrels vary considerably in their capacities. It is much more satisfactory in the long run to give correct weight and good values than to attempt to sell an unknown quantity of low-grade, dirty gum by the barrel. At practically no extra cost the farmer who is careful can make and gather his gum relatively free from trash such as bark, chips, water, etc.

The farmer will be protecting himself and better stabilizing a profitable cash crop if he will give the buyer a square deal in the matter.

SECOND DISTRICT

W. D. Young, Dist. Forester,
Gainesville

CHICOPEE FOREST A TYPICAL WATERSHED

During the year 1926 a unit of Johnson & Johnson Manufacturing Company known as the Chicopee Manufacturing Corporation was established near Gainesville, Georgia. This company manufactures various cotton medical supplies and is considered one of the largest mills of its kind in the country. It is situated approximately 3 miles from Gainesville on the Southern Railroad and Highway No. 13. It is considered a MODERN MILL and VILLAGE. In fact every thing necessary to make well rounded living conditions for the workers is provided in the village proper.

To secure the necessary water supply for the mill and village, the owners decided to purchase an area adjoining the village site which embraces a small creek watershed. Much of the land within this area was worn out farm land gullied and eroded. The watershed area contains approximately 4,000 acres. Considerable trees of species native to this section were growing on the area but due to forest fires, cutting of undersized trees for fuel and lumber by the former owners, and a large percent of the area in open farm land, it was necessary that a program of forest planting and management be instituted to secure a ground cover thereby enabling the village and mill to have a permanent water supply of sufficient volume.

With this problem in mind the officials of the mill made representations to the

Georgia Department of Forestry for aid. Aid from the Department of Forestry was secured and during the late summer and early fall of 1927 Mr. Alfred Akerman, then in charge of Management and Mr. E. Bauer, Field Assistant, were sent into the field on a cooperative basis to secure the necessary information to be followed in making recommendations as to the policy to pursue in securing the desired results.

A forest survey was made showing timber types present at the time and open land. A management plan and map were drawn up, a program of forest protection laid out, recommendations for the establishment of a forest nursery and a planting plan also.

As a result of this survey and recommendations a small nursery was started. Operation of this nursery was carried on the first year but due to failure of seed germination and other causes the nursery was abandoned the following year and seedlings for planting purposes were purchased from the State Nursery then located at Athens, Georgia. During the year 1928 Mr. E. B. Stone was employed as Assistant State Forester with headquarters at Gainesville. The cooperative aid of the Georgia Forest Service was turned over to him.

As a result of close supervision and recommendations on the part of the Georgia Forest Service, forest protection has been secured and maintained with good results. As a result of forest protection much of the area then considered area for planting will not have to be planted. New growth is coming in as a result of natural seeding and the original trees at the beginning of the project have taken on new vigor. Of course many acres are still open because the program of management and planting was recommended to extend over a period of years due to the limited field force employed. However the planting program will be completed within the next few years under the present system and then management on a system of forest use will be mapped out, as provided in the plan.

The following is a record of planting beginning with the year 1928.

1927-1928—Loblolly pine	10,000
1928-1930—Loblolly pine	8,000
Black Locust	400
1930-1931—Loblolly pine	20,000
1931-1932—Shortleaf pine	4,500
White pine	1,000
1932-1933—Loblolly pine	12,000
Slash pine	2,000
1933-1934—Loblolly pine	19,000
Longleaf pine	1,000
1934-1935—Loblolly pine	15,000
1935-1936—Loblolly pine	50,000
	142,900

The planting of White pine, Slash pine, and Longleaf pine was done for experimental purposes.

An average of 90% of all seedlings planted have survived.

FOURTH DISTRICT

**W. G. Wallace, District Forester,
Columbus**

FOREST MANAGEMENT ON PRESIDENT ROOSEVELT'S PINE MOUNTAIN FARM

Near Warm Springs President Roosevelt owns a tract of approximately 2,000 acres of land. Of this amount, only two or three hundred acres are in cultivation. The remainder of his farm consists of forest land, most of which is covered with a mixed growth of scrubby hardwoods and a widely varying density of pines. The land is poor, rocky, mountain land not capable of producing a rapid rate of tree growth. However, some valuable longleaf pine of virgin quality is found on the place. Mr. Roosevelt is having this pine cut for local market. A premium price is secured for the longleaf heart pine.

As district forester, I recently had the opportunity of inspecting this tract of timber and the logging operation, in company with Mr. Roosevelt, together with his farm manager, Otis Moore, and Mr. H. N. Hooper, General Manager of the Warm Springs Foundation. Mr. Roosevelt proved to be a good forester, but of course he was not familiar with our native pines and their growing habits. He was primarily interested in cutting his mature pines according to good forest management practices, which would result in natural reforestation, and which would allow periodical successive cuts of quality timber. To this end a plan was worked out and is being put into practice under supervision of the district forester.

Mr. Roosevelt was found to have a distinct dislike for the scrubby blackjack oak, which is so common on Pine Mountain and which grows to the detriment of more valuable species, such as longleaf pine. His dislike was so profound, in fact, that he wanted to see the blackjack oaks on his place cut down, and if they could not be used for fuel wood, then he wanted them piled and burned. It was Mr. Roosevelt's idea that areas so cleared would naturally reseed to longleaf pine, the native pine of this region. Due to various circumstances, the district forester disagreed as to this area reseeding to longleaf pine. As a result, a plan was formulated whereby from 15 to 25 acres of this land is to be cleared of undesirable species each year and then artificially reforested with pine by planting nursery grown seedlings produced by the state forest nursery at Albany. It is expected that the local market for fuel wood will go far towards absorbing the removed undesirable hardwoods, and that the returns from their sale will greatly assist in financing the reforestation project. Plans

were tentatively made to adapt the boilers of the Warm Springs Foundation heating plant to use wood along with coal so as to dispose of the undesirable hardwoods. This plan of reforestation is also put into practice on the Warm Springs Foundation property.

Under present practices, slabs and edgings from the sawmill on this property are cut into firewood lengths and sold. Tops of felled trees are also utilized for firewood, and the branches are disposed of so as to reduce the fire hazard.

The president was very much interested in the possibilities of the slash pine, and it was planned to make experimental plantings of this species next year to prove its adaptability for growing on Pine Mountain.

The Warm Springs Foundation is starting its annual planting program by planting 15,000 longleaf seedlings this winter. President Roosevelt is ordering several thousand seedlings for his personal project as the beginning of an annual planting program on his own land.

SIXTH DISTRICT

**Jack Thurmond, Dist. Forester,
Savannah**

T. P. O. Manager's Meeting

Recently a meeting was held in Reidsville and all TPO Managers and Project Superintendents in the Savannah District attended.

All phases of TPO work as related to Emergency Conservation Work were discussed and each TPO Manager and Project Superintendent had the opportunity to discuss their problems, as affecting their particular TPO and Camp.

The object of this meeting was for the purpose of coordinating the work of the TPO Manager in order that the TPO's can utilize more fully the benefits that arise as a result of the work done by the Camps in the District on the TPO areas.

Similar meetings will be held quarterly at some central point in the District that is convenient to all concerned.

Canoochee River T. P. O.

The Canoochee River TPO, covering timber lands in Emanuel and Candler Counties, recently purchased a Tractor and Plow unit for use in maintaining Primary Firebreaks and construction of secondary firebreaks.

The unit consists of a 40 H. P. Caterpillar Diesel Tractor and Two-way Hester Plow. This equipment is to be used in secondary firebreak construction and a grader will be used for maintenance on primary firebreaks.

To date, the tractor and plow unit has constructed over one hundred miles of sec-

ondary firebreaks on various tracts of TPO land under the direction of Mr. Graham Coleman, the Manager of the TPO and if the present plans are carried out, secondary firebreaks will have been constructed on all lands listed in the TPO by February 1st, 1936.

New T. P. O. Secretary

Mr. Leon Ehrlich, of Swainsboro, and one of the members of the Board of Directors of the Canoochee River TPO, was appointed Secretary and Treasurer of the organization.

Mr. J. W. Stephenson was the former Secretary, but recently resigned and Mr. Ehrlich was appointed in his place.

Mr. W. C. Rice, a prominent Naval Stores Operator and TPO Member, was appointed on the Board of Directors to fill the vacancy left by Mr. Ehrlich.

Tar City T. P. O.

At the last meeting of the Directors of Tar City TPO in Reidsville, it was definitely stated that the organization would purchase a tractor and plow unit for use in maintenance work and construction of secondary firebreaks.

Another meeting of the Tar City TPO will be held on December 23rd, at Reidsville, at which time the order for the equipment will be given.

E. C. W. Notes

Mr. A. A. Simonton, who was formerly Chief Foreman at P-82, Reidsville has been transferred from the Savannah District to a camp in the Rome District, as Chief Foreman.

Mr. W. K. Peagler, formerly Chief Foreman at P-63, McRae, has been transferred to Camp P-82, Reidsville, as Chief Foreman.

The allotment of pine seed that was assigned to camps in the Savannah District has been completed. The seed have all been collected, cleaned and stored at P-82 Reidsville, from which point they will be sent to the State Nursery in Albany. There is 1,100 lbs. of Slash, longleaf and Loblolly altogether.

AN APPRECIATION

(Continued from Page 3)

The Forestry-Geological Review manager consider it a privilege to have been placed on the mailing list of "Peppermint", a publication by Company 1450 of Georgia CCC Camp P-68, Douglas, Georgia. This spicy periodical dealing principally with matters of interest to the boys of the camp, but bringing items of interest to those on the outside, is about a year old, and has kept up an interesting flow of information concerning camp activities, personal idiosyncracies, educational matters, and has been a splendid outlet for the class in Journalism.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE DIVINING ROD, A STEP-CHILD OF THE ALCHEMISTS

BY GEOFFREY W. CRICKMAY

Everybody with a spark of imagination has at some time wished to look into the future, to peer beyond the stars, or to see inside the earth. This natural urge in the minds of a few really brilliant men was responsible for the invention and development of the telescope, the microscope, the seismograph and countless other instruments for finding facts that our unaided eyes or poor perception fail to detect. Before the invention of such instruments, men were accustomed to seek the answer to all obscure questions by consulting fortune tellers or diviners, whose pronouncements were based to a large extent on superstition, or fetish, or fanciful dogma. These pseudo-scientists were often influenced by the behavior of material objects, such as the divining rod. This age-old custom persists even today. As minor decisions are made by the toss of a coin and the fortune teller's story is believed by the more credulous, so the use of the divining rod still persists in some parts of Georgia.

A divining rod is a simple device consisting most commonly of a hazel stick with a Y-shaped fork or two separate twigs bound together at one end in V-form. Willow, cherry, and apple woods are used but hazel, particularly witch hazel, is claimed to be the most effective. Metal rods equipped with needles, springs, and vials of metallic ores have been manufactured by unscrupulous people. These embellishments give the rod a more professional appearance but are not essential. Only a few people, it is claimed, are sufficiently "susceptible" to get good results but a large number of people are eager to believe in the results obtained. The Division of Geology annually receives numerous inquiries about divining rods: Where may they be obtained? How are they used? And how do they work? To his last question, the answer is: They do not—divining rods have no scientific basis whatsoever and belong entirely to the realm of superstition and charlatanry.

The divining rod goes back to some early time when man carrying a stick or club treated it as his companion and asked of it the questions, particularly moral questions, to which he most desired answers. This was common practice with the Medes, Persians, and Scythians who had a high regard for the staff or crook. The rod came to be used as a portable oracle to detect guilt, de-

tion. An ancient Germanic tribe, the Fresnians, employed rods in their churches to detect murderers.

The alchemists, those brazenly unscientific chemists of the Middle Ages, saw at once the possibilities of the divining rod and it is to them that we owe its development for the detecting of material objects. This was the age that saw the growth of the weirdest and most unreasonable types of theories. Demonstrative proof was rarely asked and even more rarely given. By the end of the 17th Century, it was in common use for finding hidden treasure and locating metallic ores. The alchemists and their strange theories are now all safely dead and buried in the past, but their step-child, the divining rod, has lived on. Even in this day of reason, it is in wide usage and has been falsely credited for locating minerals, ground water, and oil pools.

The manner of using the rod is as simple as its construction. The forks are grasped lightly in the hands of the operator who walks over the ground to be tested. The rod, it is claimed, constantly exerts a pull towards a point on the earth directly above the materials sought. Some people have, in all seriousness, reported this pull to be so strong at times that the rod is whipped out of the operator's hands. Thorough tests have shown that the rod by itself is quite inert and no amount of ritual or consecration will actuate it without the aid of human hands. Anyone can easily demonstrate this fact by bringing metals, ore minerals, water, or oil near a carefully suspended rod which will exhibit no response whatsoever as long as it is not touched. Movement of the rod, therefore, originates with the operator and may be conscious and forced, or sub-conscious and involuntary. Most diviners, who honestly believe in the rod, regard its movements merely as an expression of their own sympathetic psychic attunement to the object sought.

There have been many and varied explanations offered for the supposed behavior of the divining rod. To the ancients, divination of all sorts was too closely knit with their theologies to require any worldly explanation. The alchemists needed but one mystic word, "affinity", a word which held great significance in their crude theories. Many believed at this time in a material devil and to them there was no reason why demoniac agencies should not activate the rod. Others held that the peculiar gift of the operator was conferred by divine favor and that the Diety and not the devil was causing response of the rod. The practice of divining thus became surrounded by highly pious ceremonies and formulas. The rod, like the compass to which it was thought to be closely related, was regarded as something a little beyond the understanding of ordinary men—something best left in the hands of those select few who were blessed with the "gift."

Even at this time there were thoughtful

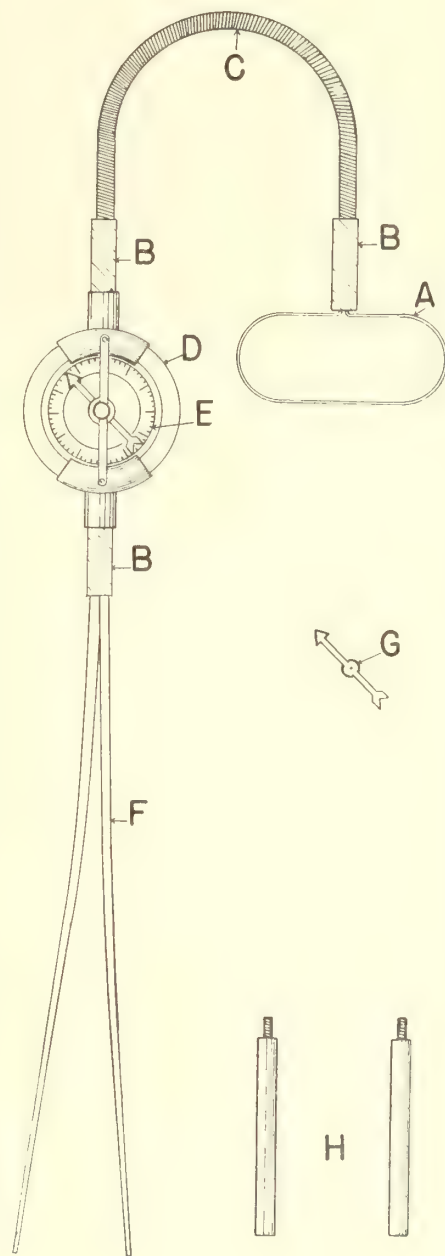


FIGURE 1.—Divining Rod in Georgia State Museum.

A. Handle. B. Square metal blocks. C. Spring. D. Glass tube filled with metallic ores. E. Graduated circle with free swinging pointer. F. Forked sticks, painted ebony black. G. Extra pointer. H. "Stoppers" to be inserted in place of spring and sticks when instrument is not in use.

side future events, or advise a course of ac-

men who could see no reason in the rod. In 1546, Agricola, a man of shrewd understanding and a mining engineer of prominence, condemned it and recommended the miner to restrict his study to the indications of nature. A new theory was later invented, designed to be more appealing to the skeptic scientists. All matter, it was claimed, emits rays of minute particles or corpuscles, called *corpuscula effluvia* (analogous to the *quanta* of modern physics). These particles must certainly have a strong effect on so "delicate" an instrument as the divining rod. Some people with particularly sensitive skin texture were claimed to be more susceptible to these emissions and thus only the select few could qualify as efficient diviners.

Unfortunately for the corpuscular story, a far more alluring theory soon appeared in the scientific sky through the brilliant researches of Galvani and others in the field of electricity. Just as the ancients had placed all obscure and apparently supernatural things in the field of religion, so the pseudo-scientists of the day ascribed the cause of everything mysterious to electricity. Electricity was the key to all scientific puzzles; it was the cause of the strange behavior of the divining rod; it was the *elan vital* of life itself. On the basis of the electrical theory, the rod was first applied extensively to the finding of underground water and, with the dawn of the 20th Century, to the mapping of oil pools.

It is perhaps surprising that such elaborate explanation should be offered for an instrument whose use is largely discredited. Actually, there are diviners who have demonstrated a certain ability to find hidden objects, but their powers seem to be dependent more on their mental processes than on the rod. In all demonstrations the position of the hidden object has been known to at least one member of the group, and it has been suggested that thought transference to the diviner may subconsciously direct his muscular action and consequently the rod's movements. Psychologists have shown that some people are particularly sensitive to mental reception of the concentrated thought of others. Many diviners may be equally sensitive, but sensitive to human thought rather than to ore, oil or water.

It would undoubtedly surprise many people to know how extensively the divining rod has been used in comparatively recent years for locating oil wells and how many thousands of dollars have been paid by gullible people to the charlatans of the trade. No satisfactory explanation has ever been offered as to why the rod should pull towards oil as expertly as towards water or towards lead as strongly as towards gold. There is no reason why the dipping of the rod or the oscillation of an attached needle should record depth in the units of the country: feet in the United States, metres in Europe. In fact, there is nothing very

satisfactory about the divining rod. The worst feature involved in its use is that it frequently leads to false hopes, wasted effort, and unjustified expenditures for development. It would be the height of folly to base any mining work on the dictates of the diviner.

There are a number of scientific instruments, designed to locate mineral deposits and oil reservoirs hidden in the earth, which should be clearly distinguished from the pseudo-scientific divining rod. The successful operation of all these sensitive instruments depends on specific properties of the materials sought. The magnetometer measures the declination, dip, and horizontal intensity of the earth's magnetic field. Certain iron-bearing ores strongly disturb the readings, and consequently measurements of this local disturbance points to the location of the ores. Metallic ores and salt water associated with oil are better conductors of electricity than ordinary rock and thus, by measuring earth resistance to electrical impulses, pertinent information may be obtained. Different types of rock react in different ways to earthquake waves. Oil geologists have used this fact to map out sub-surface formations by determining the character of vibrations artificially set up by explosives and recorded on seismographs. Rocks also differ in their density. A special instrument, the torsion balance, has been designed to measure densities of rocks hidden below the earth's surface, by determining minute deviations from true gravity. This method has proven particularly helpful in locating salt domes (the salt having a much smaller density than the surrounding rock) with which oil is in some places associated. All these instruments are very carefully constructed, they are all based on scientific principles, and their use requires the knowledge of experts. Each has its limitations, each is designed for special use. Divining rods, on the other hand, belong to mysticism and not to science.

Citizens of the State should place no reliance on the diviner's advice, whether it be gratuitously given or not. The Division of Geology would welcome a report on the operations of anyone purporting to find minerals, ground water, or valuable objects by use of divining rod, mineral stick, or doodle bug, for whose services a charge is made.

The information in this paper has been obtained mainly from the following reports:

Raymond, R. W., The Divining Rod: Min. Res. U. S., 1882, pp. 610-625, 1883.

Ellis, A. J., The Divining Rod, a history of water-witching, with a bibliography: U. S. Geological Survey, Water Supply Paper, 416, 1917.

Butler, G. M., Some facts about Ore Deposits: Arizona Bureau of Mines, Bull. 139, pp. 71-77, 1935.

FLUORESCENT MINERAL DISPLAY INSTALLED IN THE STATE MUSEUM

An exhibit of fluorescent minerals of unusual interest and beauty has recently been installed by the Division of Geology in the State Museum near the elevator on the fourth floor of the Capitol.

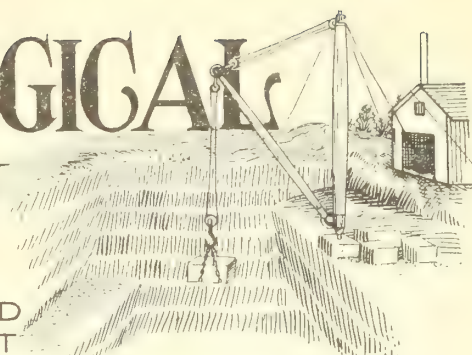
Certain minerals have the unusual property, called fluorescence, of glowing when exposed to ultra-violet rays. A special mercury-arc light is used to give off these invisible ultra-violet rays which on striking the minerals are changed into visible colored light which seems to come from the minerals as though they were illuminated from within.

The minerals are first viewed by ordinary light. At present the display contains several specimens of Stone Mountain granite with a coating on one surface of hyalite, a variety of opal; three specimens of dogtooth calcite crystals from a cave near Marble Hill in Pickens County; two pieces of fluorite from Gordon County; several pink corundum crystals from Habersham County; a piece of common opal from Habersham County; a group of fluorite crystals from England; and specimens of opal and amber from outside of Georgia loaned by Mr. William B. Pitts. Others will be added from time to time. A switch at the left of the case turns the illumination from the ordinary light to the soft purple glow of the mercury-arc light. The ultra-violet rays given off by this lamp (not the small amount of visible purple light) cause the hyalite on the Stone Mountain granite to glow with a ghostly bluish-white light. Two of the calcite specimens have a pinkish-red glow whereas the third which under ordinary light looks exactly the same, has a dirty white color. The fluorite specimens have a beautiful blue color and the corundum a deep red color. The opal and the amber glow with a milky-white color. The effect is truly remarkable.

The Division of Geology was represented at the annual meetings of the Geological Society of America in New York on December 26th to 29th by Assistant State Geologists G. W. Crickmay and Lane Mitchell, both of whom gave papers. Dr. Crickmay's paper was on the age of the Talladega series of rocks in Alabama, Georgia, and North Carolina. His work in mapping these rocks in Georgia during the past several years has convinced him that they are much older than the age previously assigned to them by most geologists who have described them in the past. His paper is a valuable contribution to our knowledge of Georgia geology. Mr. Mitchell described the finding and excavation of remains of mastodons and mammoths at Savannah last summer. Because of the popular nature of the paper it was one of the many given at the meetings, to be described in the newspapers.



FORESTRY-GEOLOGICAL REVIEW



DEPARTMENT OF FORESTRY AND
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No. 2

AGAIN MONEY TALKS—NEW ARGUMENTS AGAINST BURNING THE WOODS AFTER TURPENTINING OPERATIONS

SAVANNAH MORNING NEWS CALLS ATTENTION IN TIMELY
ARTICLE TO VALUE IN DOLLARS AND CENTS OF TREES
NO LONGER FIT FOR TURPENTINING

The Savannah Morning News of January 21, 1936, calls attention under the caption "There's Profit in Pine Poles if Forests are Protected from Wasteful Fires", to additional prices that may be secured per pole, when no longer profitable for turpentinizing. We quote from the Morning News:

"The economics of timberlands protected from fire is strikingly illustrated in an analysis made by W. M. Oettmeier, forest manager of the Superior Pine Products Company, who has 220,000 acres of land in Clinch county near Fargo, Ga., under his charge. This huge acreage is protected by the most modern methods, including short wave radio.

"The average timber protective organization gives its members insurance against fire at a cost of three cents per acre. Mr. Oettmeier shows how the added revenue from one pine telephone pole or piling which has been protected from wood fires will cover the cost of TPO membership dues on one acre for a period of almost 36 years.

"He figures this on the basis of the four feet which can be saved on the average 35, 40 and 45 foot poles which have been used first for turpentinizing operations. At current prices an average increase of \$.07 per pole would be received by the timber owner.

"When pine timber that has been worked for turpentine is burned over at regular intervals, especially after the timber has ceased to be worked and the boxes not stacked, the gum is burned from the faces and they become charred," Mr. Oettmeier says.

"Various types of pine borers bore holes in this charred turpentine face from which protecting gum has been burned. This condition can be easily noted by observing regularly or periodically burned over turpentine land.

"Practically every tree that is charred will show from a few to hundreds of such holes in the old face. These holes evidently facilitate the access of moisture and fungi to the center of the tree, which, without question, causes the doty or rotten spots that appear in the butt of the log when it is cut.

"These doty spots are from one to several inches in diameter, and vary from a soft, pulpy spot to a distinct rotten hole. When timber is cut for poles, just an indication of such a spot will cause it to be culled or cut back.

"Considering that in many cases, when one face is worked out on the tree, this face is burned over quite a few times before the tree is back cupped, after the tree is back cupped it is worked from five to seven years and then possibly this face in turn may be burned a few more years before it is cut.

"In other words, in most instances the turpentine tree would be cut on an average from 12 to 15 years after the gum had been burned off its original face, showing a long period of time in which the doty spots and rot can work their way up through the sound wood.

"From experience in manufacturing a large quantity of poles out of periodically burned over turpentine woods, it has been found that the average tree must be butted off from 4 to 5 feet above the turpentine face in order to secure a perfectly sound pole. This 4 or 5 feet, of course, is a direct loss due principally to burning the gum from the turpentine face. However, there is even a greater loss than this from the pole standpoint.

"Present day pole specifications allow a fresh turpentine face on a pole providing it is sound and does not extend closer than two feet of the ground line of the pole. Since the average ground line is approxi-

(Continued on Page 2)

CITY OF SAVANNAH PLANTS PINES AS LIVING MEMORIAL TO DR. CHAS. H. HERTY

Groves of Trees More Suitable than
Bronze Tablets as Testimonial to
Industrial Development by this
Great Georgian

The Naval Stores Review and Trade Journal of December 21, 1935, carried a most interesting account of a proposed living memorial for Dr. Chas. H. Herty, in appreciation of his accomplishments along industrial lines, and of his untiring and unselfish devotion in the development of his native state.

With the permission of the above publication, we take pleasure in reprinting the entire article.

"Probably within the city limits of Savannah there is today not standing a single pine tree of sufficient size to attract public attention.

"Many years ago there were some splendid stands of pine trees in the city, one particularly noticeable stand being in Forsyth Park where it attracted the attention of all visitors and was admired by all residents passing through that beautiful parkway. Great windstorms brought these trees to the ground or did so much damage that they had to be removed.

"Now the Park and Tree Commission plans to re-establish pines in the city as an evidence of public appreciation of the magnificent work done by Dr. Charles H. Herty, and as a living, growing memorial to that great chemist and industrial leader. One thousand trees will be put out to advantage, and a few years hence one or more groves of them will once more greet citizens and visitors alike and win admiration as splendid specimens of what is probably the world's most serviceable tree to mankind.

"It has been suggested, and the idea is certainly one worthy of attention, that other cities and towns, especially in the great pine belt of Georgia, which is to become the center of an increasing paper and pulp industry drawing its supplies from the pine forests, follow Savannah's example and create groves of pines in Herty parks.

(Continued on Page 6)

Forestry-Geological Review

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

AGAIN MONEY TALKS

(Continued from Page 1)

mately six feet, an additional four feet could be added to the pole, making a total of 8 to 9 feet. Considering that poles are sold on both a length and a grade basis, depending on circumference measurement at a point six feet up from the base, adding this length to the butt end of the pole not only increases the length, but in addition increases the grade.

"From current pole prices f.o.b. cars loading point and using only the three principal lengths, namely, 35, 40 and 45 foot poles, an average increase of \$1.07 per pole would be received by being able to use the pole down to and including about four feet of the turpentine face.

"This figure shows only that saving on those poles that are actually manufactured; but when one considers that an additional 8 or 9 feet can be added to the bottom of the pole, possibly 20 or 25 per cent more pole could be in an area due to the fact that where this long length of rotten butt must be cut out, approximately the 20 or 25 per cent of poles would have to be left standing, due to the fact that they would be too short or small.

"This great saving per pole can be brought about simply by not burning the woods, for when they are burned, the old turpentine faces that are caked with gum readily catch fire and, of course, it is all burned off, leaving the wood unprotected and open to insect attack, which is the principal cause for butt rot in most southern pine timber."

In commenting on this article from the Morning News, Dr. Chas. H. Herty says,

"This article, I think, gives one of the finest arguments against burning the woods after turpentine operations have ceased, that I have ever seen. Most of our timber owners feel that when turpentine is finished, they have no further interest in the timber. Oettmeier's figures on the loss in connection with getting out poles is certainly a startling contrast to the small expenditure for protection through TPOs. It is a brand new argument to me, and I think ought to be given just as wide publicity as possible."

REPORT COVERING ACTIVITIES BY CIVILIAN CONSERVATION CORPS GIVEN BY DIRECTOR

Actual Figures Given For Period April 1933 to September 30, 1935

Robert Fechner, Director of ECW, has made a detailed report covering the activities of the Civilian Conservation Corps from April, 1933, to the close of the last fiscal year, June 30, 1935. At the same time he has made public figures indicating the number of persons given employment and the present value of the work completed by the CCC through September 30.

In the period covered—April 1933 through September 1935—more than 1,500,000 persons had been employed in CCC work.

Beginning with an authorized strength of 250,000 men on April 5, 1933, the Civilian Conservation Corps was increased from time to time until on August 1, 1935, it had a strength of 519,920 enrolled men. This included 10,115 Indians working on Indian reservations, and 4,022 men working on CCC projects in Hawaii, Alaska, Porto Rico and the Virgin Islands.

Among the principal items of work completed up to September 30, 1935, upon which the valuation was based, are the following: 405,402,500 forest trees planted over denuded areas; 62,593 miles of new service roads and truck trails constructed through timbered areas principally for fire protection (of this amount nearly 60,000 miles were truck trails), and 30,121 miles of new telephone lines built into the nation's forest and park fire detection systems. Service roads and truck trails were maintained over 155,000 miles; telephone lines were maintained over 75,000 miles; over 1,223,000 man-days were devoted to fire pre-suppression and more than 2,244,000 man-days spent in fighting forest fires. A total of 44,040 miles of firebreaks were opened up through forest areas; fire hazards reduced over 1,274,201 acres; 2,428 lookout houses and lookout towers constructed in forests and parks for fire detection; forest stand improvement work completed on over 2,094,000 acres; a total of 16,250 acres covered in campaigns to control ro-

dent destruction; a total of 5,035,158 acres covered in campaigns to reduce losses caused by beetles, moths and other insects; tree and plant disease control work conducted over 4,815,684 acres; 1,635,000 check dams built in gullies to control soil erosion; completion of timber estimating over 25,239,731 acres and construction of 26,521 vehicle bridges.

This statistical report covers Civilian Conservation Corps work throughout the entire United States.

Georgia has received her pro rata share of the funds and allotment of CCC camps since this work was inaugurated. According to figures recently given out by the Georgia Forest Service, the timber protective organizations have been given 18,000 man-years of work by the CCC camps; 57 fire towers have been built; a total of 1,255.7 miles of telephone lines have been constructed; 5,153 miles of 20-foot fire breaks, 1,136.3 miles of 10-foot firebreak and 813.3 miles of truck trails have been built; a total of 1,185 bridges have been constructed and 6,622,663 acres of TPO lands have been type-mapped. The boys in the camps have gathered for planting in state nurseries a total of 6,000 pounds of longleaf, slash and loblolly pine seed.

On the state forest parks an entirely different type of work has been done. Approximately 24 buildings have been constructed, which includes inns, observation towers, comfort stations, houses for caretakers, boat and bath houses and contact stations. Three lakes and a number of bathing pools and lagoons have also been constructed.

Other work consists of constructing picnic areas with picnic shelters, parking areas, tables and barbecue pits, landscaping, planting and sodding, remodeling and restoration of buildings, laying flagstone walks, foot bridges and foot trails, installing water systems and sewage disposal systems, fences, entrance gates, trail signs, seats and markers, and the grading and resurfacing of park roads.

Charles H. Herty, Jr. Honored

Charles H. Herty, Junior, research metallurgist, with the Bethlehem Steel Corporation, has recently received the first medal of award offered by Francis J. Clamer and presented by the Technical Society of Philadelphia for meritorious work in the field of metallurgy.

Mr. Herty is the son of Dr. Charles H. Herty, Sr., most outstanding industrial chemist of the day, whose many friends in Georgia and throughout the nation will be interested and much pleased to take note of this honor paid the splendid son of an illustrious father.

Student of Sale City High School Wins First Prize for Article on Forestry Offered by Georgia Forestry Association

The January 1936 issue of the Review carried the offer of a \$5 prize to be given by the Georgia Forestry Association to the vocational student in Georgia writing the best article on forestry, this article to be published in the Review. The offer continues through June, with the same prize given each month, and the awards will be made at the F. F. A. convention in June.

The first article used by the Review is one composed by Myrvin Clark of Sale City High School, secretary of the Sale City F. F. A. Club, and is entitled,

"Our Forest"

The forests of America are directly or indirectly in the hands of the farmer. These wooded acres of land have contributed more to his progress than any other of his servants. Notwithstanding this fact, the hand of man—the latest destroyer—has weighted the balance against the forest still more heavily. Places which geological and even historical records designate as fertile forest lands are now arid deserts, an evidence of devastating fires and fierce winds which completely destroyed the growth of a century in an hour.

Our forests, with their billions of trees, are the backbone of agriculture, the skeleton of lumbering and the heart of industry, and even now in spite of depletion, they are the cream of our national resources.

Our forest fortune has been thoughtlessly squandered by successive generations of spendthrifts. Almost every nation has traveled over the same road, first wasting its forestry supply and then, as the supply diminished alarmingly, being driven to frantic attempts to save this resource.

Everyone recognizes the beauty of our forests, and everyone recognizes the protection that the sheltering trees give to birds and animals. The forest is for the benefit of every individual who will preserve and treat it with kindness, and for your kindness the forest will repay you in many ways. The forests furnish fuel for the nation, pasture for thousands of sheep and cattle, and the water supply for countless cities and farms. They are the dominion of wild life and aid agriculture by preventing floods and storing the surplus rainfall in the soil for the use of farm crops. They furnish the foundation for all our railroads and produce fertile soil. They give employment to millions of workmen and form the best organized feature of the plant world.

Can you picture America if we people neglect the conservation of our forests? America will be a desert with no place to take shelter from the hot sun. Crops cannot grow; hunger and thirst will prevail and America will not progress. But turn this picture over, remove the clouds and

let's look on the bright side, where people have preserved and protected the forests. Trees are growing, streams are flowing and cows are grazing on the green grass. The farmers are harvesting their crops, boys are fishing, swimming and playing, people picnic in the shade of "Our Forest" while a cool breeze is blowing through the trees.

"God Protect Our Forest".

Interesting Facts as to Damage of Fire to Growing Timber Revealed By Recent Report of Appalachian Forest Experiment Station

In the fourteenth annual report and program of the Appalachian Forest Experiment Station, giving a summary of activities for the past year, it is very interesting to note that a study on the effort of fire to growing timber was one of their major activities. A beginning was also made in detection planning, fire weather and fire behavior studies, for which working plans are being prepared.

The principal objectives of the fire damage study are to develop methods of appraising damage and to discover the silvicultural significance of fire in the mountain hardwood stands.

During the past year much progress was made, this being indicated by the establishment and experimental burning off of the fourth of a series of large sample plots. A total of 3,500 trees were tagged and described and more than 200 reproduction quadrats were established on the Toccoa Experimental forest in North Georgia.

Some of the reports of previous studies revealed the following:

Analysis of growth and mortality following a fire in 1925 in a young stand of pitch and shortleaf pine on the Dent Creek Experimental Forest showed that over a ten year period: (a) the dominant group of trees was set back 10 years in growing time; (b) surviving trees on the burned area grew from 1-5 to 1-3 less in basal area than similar trees on the adjacent unburned area; (c) the degree of crown burning apparently does not influence mortality after the first two years; (d) growth of trees above 4 inches in diameter is significantly influenced by the extent of crown burning. Taking the 6 inch trees as an example, those with 60 per cent of their crown browned had an average basal area increment half again as great as those 80 per cent browned and twice as great as those 100 per cent browned.

Examinations over a ten year period of a hardwood stand 2 to 14 inches in diameter which was burned in 1925 indicate that: (a) the total basal area of the stand during the first five year period was reduced by 1-5 and that during the second five year period, growth of surviving trees scarcely more than offset loss through

mortality; (b) in the 4 to 7 inch diameter classes inclusive, the total basal area of the principal species—white, black and scarlet oaks—in the upper crown classes equaled the original amount only after 10 seasons of growth; (c) during the same time total basal areas of the lower crown classes decreased by 50 per cent, and it is evident that for trees 8 inches in diameter, or less, any advantage derived from the trimming effect of the fire was nullified by mortality within the group; (d) considering only total basal area, there has been at least a 15 year loss in growing time as a result of the fire.

EXECUTIVE COMMITTEE OF GEORGIA FORESTRY ASS'N MEETS AT ATHENS

There was a meeting of the executive committee of the Georgia Forestry Association held at Athens on January 23, in Memorial Hall on the University of Georgia campus. Mr. T. G. Woolford, president, of Atlanta, presided.

Mr. Herbert L. Kayton, secretary, reported that in response to a canvass of the superior court judges he had received response from nine who had agreed to instruct their respective grand juries with regard to their duties in curbing forest fires in the state. Some of these judges replied that it had been their custom for periods ranging from months to years to charge the grand juries regarding the fire menace. It was brought out during this discussion that Chatham county had recently had its first conviction for setting the woods on fire and the perpetrator was sentenced to serve 60 days.

Another feature of the meeting was continuation of the award to vocational teachers in the state doing outstanding work in forestry during the school year. This prize has been designated the Herty prize and has heretofore been for \$75 in one lump sum; this prize has been divided and \$50 will be given the teacher doing the best work, with a second prize of \$25 to the next best. In addition the colored teachers have been offered prizes of \$15 and \$10 respectively for similar work in forestry.

An entirely new prize of \$5 each month until June has been offered to the forestry student in the vocational schools who will write the best article on forestry activities. These prizes will total \$25 and will be awarded at the F. F. A. convention in June. No student may win more than one award.

The members of the committee were guests of the University at a luncheon. Chancellor Sanford addressed the luncheon party, telling them of an effort being made to change the curriculum to meet the needs of changing economic conditions.

The next meeting of the executive committee will be held in Columbus, Georgia, on March 19.

UNUSUAL USE FOR WOOD

Elementary School in California Makes "Woods" Map of United States.

During the school year 1929-30, the Georgia Forest Service received a request from the Seventh and Eighth grades of Plymouth Elementary School, Plymouth, California, for a piece of wood native to Georgia to be used in making a map of the United States. It seems that a similar request was sent to each state in the Union.

Nothing was heard from the school regarding its project until recently, when a letter was received from the Seventh grade teacher advising that the map had been completed and they were sending us a photograph of it together with a list of the woods and the states from which they were secured. We are reproducing the map in order that the readers of the REVIEW may see how it looked after completion.

In a letter of appreciation to the Georgia Forest Service for their cooperation in making the project possible, the teacher stated that this map was entered at the California State Fair, and in addition to receiving special attention, was awarded a bronze replica of the seal of the State of California. Considerable publicity was given the project through the newspapers of the state.

The Georgia Forest Service considers this one of the most interesting and unique projects dealing with wood ever brought to their attention and congratulates the teacher and pupils on this most unusual undertaking. This would seem an ideal project for any class.

DEPARTMENT NOTES

Harold M. Sebring, Assistant State Forester in Georgia since October 1, 1929, resigned effective January 1, 1936, to become associated with the Soil Conservation Service. Mr. Sebring is a graduate of the Pennsylvania State Forest School at Mont Alto, Penna., class of 1925, with Bachelor of Science degree in forestry. He served as District Forester with the North Carolina Forest Service for nearly three years and in the same capacity with the Florida Forest Service for over a year, coming to Georgia in 1929 as Assistant State Forester. When ECW work was started in 1933, he was put in charge of the work of the forestry CCC camps.

Mr. Sebring will be located at Athens, Georgia.

Succeeding Mr. Sebring as assistant forester is Jack Thurmond, who has ably served the Forest Service as district forester for six years. Mr. Thurmond graduated from the Forest School, University of Georgia in 1928 with a degree of Bachelor of Science in forestry. He is well qualified to take up this work because of his knowledge of forestry conditions in the state and his experience with the fire protection program. While district forester at Savannah the acreage under organized fire protection has grown from a small beginning of 10,000 acres about five years ago to over 800,000. Mr. Thurmond has been of invaluable assistance to timberland owners and naval stores operators.

W. Gordon Wallace, also a graduate of the Forest School, University of Georgia,

class of 1930, succeeds Mr. Thurmond at Savannah. He has been district forester at Columbus, Georgia, since 1931, and has demonstrated unusual ability in handling the fire protection program in Muscogee and surrounding counties, and it is felt that the work in the Savannah district will be efficiently handled by Mr. Wallace.

At a meeting of the Commission of Forestry and Geological Development at the State Capitol on January 17, the following changes were made, effective at once: Richard W. Smith, State Geologist since October 1933, when he succeeded the late S. W. McCallie, was reappointed to this office. Previous to the death of Dr. McCallie, Mr. Smith had served as assistant state geologist for seven years and since his incumbency has developed an up-to-date geologic library second to none in the South and is creating a gazetteer of all streams and place names in Georgia. Mr. Smith was made secretary to the Commission.

The state forester was not reappointed by the Commission, no reason being given for this action. Previous to his appointment as state forester, Mr. Lufburrow had done forestry work in West Virginia, Virginia, the Carolinas and Mississippi, and at the time of his appointment as state forester was supervisor of the Alabama National Forest. Mr. Lufburrow is a native of Screven county, Georgia, and a graduate of the Forest School, University of Georgia, class of 1914. He has served his native state well, developing a forestry program that is the admiration of other states, several features of which have been copied by other forestry departments.

Jack Thurmond was appointed acting state forester until a permanent appointment is made by the commission.

Mrs. M. E. Judd, member of the Commission of Forestry and Geological Development, and State Park authority under the Commission, and Mr. Edwin H. Sims, Superintendent of State Park Construction, attended the meeting of the National Conference on State Parks, held in Washington, D. C., January 22, 23 and 24. The Conference on State Parks was held under the direction of the Advisory Council of the American Planning and Civic Association and was attended by officials of the National Park Service, in Washington, State Park officials from various states, members of the American Society of Landscape Architects, and many others.

Some of the subjects discussed embraced A Worthy National Park System; Standards and Policies applied in National Park Recreation as related to parks; archaeological and historical sites, wild life and legislation.



A FORESTRY POLICY FOR THE CHATTAHOOCHEE VALLEY

By W. G. WALLACE, District Forester

Any program designed to build the economic and social stability of the Chattahoochee Valley and its people must carefully consider the importance of its forests and idle land, if such a program is to prove permanently effective. This is dictated by the fact that considerably more than half of the Chattahoochee Valley consists of timberland, and idle land best suited to the growing of timber crops. Such an area, as a whole, can either be an asset or a liability. As an asset it will multiply the profits and benefits made from a program of agricultural and industrial improvement; as a liability, it will be a "drag" to any forward movement planned.

It is not likely that the forested land will ever prove to be a liability. Nature, in the more fortunate South, is capable of waging an aggressive fight even in the face of indifference and ignorance. Regardless of lack of encouragement, and the attacks of its bitterest enemy, fire, the pine forest in the South is generally capable of maintaining itself, and is often able to make erratic and slow, but sure, headway. As a whole, the forests, through annual growth, are paying taxes and a small margin of profit to their owners. But in many individual cases, forests are unproductive—a liability to the owner who, through bad management, may in the long run prove not to be an asset to his county and state.

Assuming that the forested land is making very slow but sure headway, let us consider the idle land problem—land that has proven to be too poor and eroded for further profitable farming. It has, you might say, been abandoned. A patchy growth of broom sedge is to be found on areas where raw gullies and sheet erosion have not completely assumed control. Sometimes a few scattered, scrubby pine trees are seen.

Such areas are generally over-run by periodic grass fires which prevent natural reforestation and insure the speeding up of soil erosion forces. Not only are such areas totally unproductive, they are assuming less and less chance every year of ever being profitably productive again, at least not for many decades to come. But the land owner continues to pay taxes on these acres as well as his productive acres. Also, he has the same initial investment in these acres as he does the rest of his farm. But the damage does not stop with the owner of the land; it only begins there.

Eroded soil, in the form of silt, rides with flood waters down gullies to branches and creeks where valuable bottom land is overflowed and often made useless for cultivation. Continuing on to the river, flood water and silt destroy water-carrying capacities of power lakes by settling of the silt in such reservoirs and lakes. Continuing on its mad path, more extensive river

bottom lands may be injured or ruined, and the final result is the silting of navigable rivers and harbors which cost our taxpayers millions of dollars each year to keep dredged out for navigation.

Only in very recent years has it been recognized that this process of incipient soil erosion has been going on to such a wide extent and at such a rapid rate. To continue to close our eyes and try to lead ourselves into believing everything will work out all right is to aggravate a bull that will become more and more difficult to "take by the horns" as the years pass.

After all, it settles down to a problem of proper land use. After the more desirable land has been reserved for cultivation, the balance, consisting of idle land in all stages of erosion and vegetative cover, and forested land, should be classified as to needs and given due consideration.

A broad policy for the forest and idle land of the Chattahoochee Valley will cover these four main points:

1. First, and most important of all, efficient and effective fire control.

2. Reclamation of eroded areas by the establishment of check dams and vegetative cover.

3. Reforestation of all idle land not best suited to agriculture or other use. This will call for artificial reforestation, by planting, where natural reforestation cannot be expected within a reasonable time.

4. Forest management, on sound business principles, of all existing forested areas—pointing to sustained yield and increased growth rate.

Management of wild game and fish, in connection with forest management and fire protection, is often desirable both from the standpoint of the forest and that of healthful recreation for people.

EIGHTH DISTRICT

H. D. Story, Jr., Dist. Forester
Albany

TPO Notes

Flint River TPO—Under the management and supervision of Mr. Ira Barber, secretary, supported by determined members, the Flint River TPO of Seminole and Decatur counties has gotten off to a good start.

This organization has recently purchased a tractor and plow and during the past quarter, has reworked the greater percentage of firebreaks and truck trails, and with good luck will complete the work somewhere around February first.

Although this organization got a late start, the local interest has been such that through cooperation the work has progressed rapidly and with very little trouble from fires.

Albany Nursery

Increasing demands upon the State forest nursery at Albany, Georgia, for planting stock in the past four years by land owners of the state, is evidence of increasing interest in artificial reforestation. Applications for seedlings have been made by naval stores operators, lumbermen, parks, schools, clubs and farmers, this demand having increased approximately one million seedlings per year since the establishment of the nursery.

By expansion of the nursery, a larger yield than ever before has resulted, and although this expansion more than doubled the area under cultivation, slash pine seedlings were completely sold out even before time for lifting, and the supply fell short of the demand by more than one million seedlings.

Due to liberal applications of pond muck made to the soil, and early planting, the seedlings produced this year average approximately 14 inches in height, are stocky with strong branches, thick stems and a remarkably well developed root system. All plants are thrifty and free from disease.

While the supply of slash pine seedlings has been exhausted, there yet remains for sale a good supply of longleaf and loblolly seedlings, although orders are coming in daily for them.

Landowners interested in artificial reforestation and who have a planting program planned, are placing orders in advance for 1936-37 delivery. We are hoping that it will not be necessary to prorate orders, as in the past, and every effort will be made at the nursery to take care of an increased demand.

It is hoped, by a slight expansion of the overhead sprinkler system, to produce approximately five million seedlings of good quality for the landowners of the state next year.

SIXTH DISTRICT

W. G. Wallace, Dist. Forester,
Savannah

TPO Notes

Tar City TPO Purchases Equipment.—At a recent meeting of the Tar City TPO Board of Directors, attended by M. V. Overstreet, I. S. Smith, J. Henry Kennedy and W. K. Peagler, chief forester of Camp P-82, Reidsville, it was decided to purchase an International "40" Deisel tractor, Hester plow and road machine for maintaining ECW primary firebreaks and constructing new secondary firebreaks. This equipment was to be delivered and operations started late in January. A demonstration was also scheduled to determine the feasibility of using a terracing plow for maintaining ECW firebreaks and truck trails.

GEORGIA'S FOREST FIRE LAW

For the information of those who are not familiar with Georgia's Forest Fire law, this law is given below.

Sever penalties are inflicted on those who wilfully set the woods on fire, and Georgia judges and juries are giving heavy sentences to those who are convicted of such a misdemeanor.

Extract from Code of Georgia Law 1910 As Amended Aug. 8th, 1927

ARTICLE 2.

Firing the Woods.

SEC. 227. WHO MAY. No person but a resident of the county where the firing is done, owning lands therein, or domiciled thereon, outside of any town incorporation, shall set on fire any woods, land or marshes, nor shall such persons, except between the first of January and the first of March annually.

SEC. 228. NOTICE. When such person shall desire to set fire within a said time, he shall notify all persons who occupy lands adjoining him, by residence thereon, or cultivation, or enclosure of any portion of the tract or settlement, of the day and hour of the firing, at least one day prior thereto. Such notice need not be given if, on sudden emergency, due caution should require firing to render one's premises safe.

SEC. 229. PENALTY. Any person setting fire in violation of the preceding sections shall be guilty of a misdemeanor.

SEC. 230. PENALTY FOR LETTING WOODS CATCH, ETC. Persons, either by themselves or agents, who permit fire to get into the woods, lands, or marshes, through neglect, are within the meaning of the three preceding sections.

City of Savannah Plants Pines As Memorial to Dr. Herty

(Continued from Page 1)

These pine groves will be a far more beautiful testimonial to the work Dr. Herty has done for the South and for the country than bronze tablets or a bronze statue. Each grove might be suitably marked to tell the story of the years of devotion of Dr. Herty to the industrial development of the South along lines that will best utilize its raw supplies and lift it from the position of being merely a producer of raw supplies into that of an ever-expanding industrial section."

The Georgia Forest Service congratulates the Park and Tree Commission of the City of Savannah on such a splendid project and commends a similar undertaking to other cities throughout this section.

IMPORTANT FORESTRY ORGANIZATION HOLDS ANNUAL MEETING IN ATLANTA

Society of American Foresters attended by notables from all parts of the United States

Convening at the Ansley Hotel, the 35th annual meeting of the Society of American Foresters opened a three day session Monday morning, Jan. 27. Foresters from all parts of the United States attended this meeting and discussed matters of policy and development along forestry lines.

One of the important discussions taking place was the federal acquisition of timberlands in the states, and this discussion covered both sides of the question. Many are opposed to federal ownership of state lands, these lands being developed tax free as opposed to private ownership which bears its share of the tax burden.

The development of the pulp, paper and rayon industry in the south came in for a lengthy discussion. In spite of propaganda and pressure by the established paper interests, Dr. Charles H. Herty told the Society that nothing can stop the development of a vast paper industry in the south, and brought comparative figures showing the cost of newsprint from southern pines as opposed to imported newsprint to bear out his argument.

It was pointed out that rayon of excellent quality can be manufactured from pine trees, and from experiments made at the Savannah laboratory, the same is true of cellophane, book paper and writing paper.

Mr. F. A. Silcox, Chief Forester of the U. S. Forest Service pointed out that the paper industry is already headed south, and called attention to the establishment of paper mills in various sections of the south near the source of supply.

Dr. H. H. Chapman, president of the Society, paid a tribute to President Roosevelt's work in the conservation of timber lands and the development of the forestry program throughout the entire United States. "Under the present administration," Dr. Chapman said, "greater things have been accomplished in teaching the people the conservation of timberlands than in all preceding administrations."

Discussions of the CCC activities brought out many favorable comments of this splendid work. These camps have done their share in bringing home to the people the values of conservation.

The annual banquet was held on Tuesday night, January 28, at the Ansley Hotel.

Mr. Joseph C. Kircher, regional forester in Atlanta, arranged several tours for the visiting foresters, which included visits to national forests in the northern part of the state and as far south as the Osceola National Forest near Lake City, Florida.

FROM A GEOLOGIST'S NOTEBOOK

On Saturday, January 11, about thirty members and guests of the Georgia Mineral Society took a field trip to the Warm Springs, Georgia area. P. L. Freeman's gem collection was seen at Thomaston. Trips were made to the kyanite deposits near Crest, the old bauxite mine near Warm Springs, the flexible sandstone deposit near Cold Spring, and the iron mine at Dunn's Gap. Interesting specimens were taken and much enthusiasm was manifested.

Mr. M. Richardson, of Crest, Georgia, has lent some very beautiful quartz specimens to the State Museum. Some of these specimens are bounded by plane surfaces resembling crystal faces but which were probably molded by other surfaces limiting the growth of the quartz. Some of these specimens are hollow and contain beautiful chalcedony stalactites. Others are tabular or banded. They can be seen in the State Museum at the Capitol.

The fluorescent mineral exhibit recently installed in the State Museum has attracted widespread attention. Assistant State Geologist G. W. Crickmay has experimented with powders and inks until a satisfactory fluorescent ink has been devised and used in printing labels for the display.

The Georgia Mineral Society is proceeding with the compilation of all known mineral localities in Georgia. This catalog is expected to prove invaluable to collectors and will be the first published listing of all Georgia minerals both of commercial and purely scientific interest. The new catalog was proposed in the presidential address of Dr. Frank Daniel at the last annual meeting of the Society.

The death of Henry P. Nelson, vice-president and charter member of the Georgia Mineral Society, was a blow to all his friends. Mr. Nelson had been in poor health for some time and had been forced to curtail his activities. Mr. Nelson died at his Atlanta home Friday, January 24th. He had been sales agent for the National Tube Co. of St. Louis.

Increase in Acreage Under Protection Shown Only in Sixth District

The only district showing an increase in acreage under organized fire protection is Forestry District 6, with headquarters at Savannah. The acres added since the last report amount to 16,095, which 2.0 per cent increase over previously reported acreage.

MINERALS OF GEORGIA

Brief Accounts of Occurrences and Developments of the State's Leading Minerals

Reported by THE DIVISION OF GEOLOGY

THE MINERAL PRODUCTION OF GEORGIA FOR 1934

By

RICHARD W. SMITH

The value of the mineral production of Georgia for 1934 was \$8,155,813, an increase of about seven and a half per cent over that of 1933. If we add to this the value of the electricity produced from hydro-electric plants we get a total of \$18,588,533.

Table I below is a summary of the tonnage and value of Georgia's mineral production for 1934, together with the percentages of increase or decrease over the 1933 figures. The statistics for minerals of which there are less than three producers in Georgia are confidential and cannot be revealed. These minerals are marked in the table with an asterisk (*) and their tonnages and values have been reported in combination with other such minerals so as to conceal individual figures.

The collection of the statistics of the mineral production of Georgia is undertaken by the United State Bureau of Mines and the United States Bureau of Census, with the cooperation of the Division of Geology of the Georgia Department of Forestry and Geological development. The gathering of this information is a slow process, as many firms do not report their productions until considerable time has elapsed.

Barite: Barite is a heavy white mineral which, when ground, is used largely in the manufacture of lithapone for use in paint. It is also used in the manufacture of barium salts, in the refining of sugar, in glazing pottery and enameling iron, and as a filler in the manufacture of paper and rubber. All of the 1934 production came from the Cartersville district of Bartow county.

Bauxite: Bauxite, the oxide of aluminum, was first discovered in America in 1887 near Rome, in Floyd county, Georgia. Since that time it has been mined in Floyd, Bartow, and Polk counties in northwest Georgia and in Wilkinson, Macon, Randolph, Schley, and Sumter counties in middle Georgia. The production in 1934 all came from Sumter county and was largely used in the manufacture of alum salts for use as a water conditioner.

Cement: Portland cement was manufactured from limestone and either shale or clay at two plants, one in Polk county and one in Houston county.

Clay (kaolin): Georgia produces over 65

per cent of the kaolin mined in the United States for use as a filling and coating clay in the manufacture of paper; as a filler in the manufacture of rubber, oil cloth, and other products; and for use in the manufacture of china and other white ware. Its use in these products is largely replacing the English clay formerly used. It is also used in the local manufacture of high grade fire brick and other refractories. This sedi-

from the alluvial clays of middle Georgia. Sewer pipe, structural and roofing tile, and common and face brick are made from the shales of northwest Georgia. The production will probably continue to increase with the recovery of the building industry.

Coal: Only one coal mine is reported in operation in Georgia; that of the Durham Land Company on Lookout Mountain in Walker county.

Fullers Earth: Fullers earth is a variety of bleaching clay used mainly in refining oils. That produced in Decatur county is used with mineral oils, whereas that mined in Twiggs and Wilkinson counties is used mainly with vegetable oils. A new fullers earth mine was opened in 1935 at Ochlochnee in Thomas county.

Deposits of a bentonitic type of bleaching clay which, when activated by acid

TABLE I
THE MINERAL PRODUCTION OF GEORGIA FOR 1934

Material	1934 Tonnage	Change from 1933	1934 Value	Change from 1933
Clay (Kaolin):				
Paper clay, china clay, etc.	236,606	+ 1.6%	\$1,535,946	+ 15.2%
Refractory Uses	47,950		86,177	
Marble	39,740	- 18.9%	989,254	- 29.8%
Granite	602,210	+ 8.6%	1,194,493	+ 8.7%
Clay Products			1,424,925	+ 11.1%
Bauxite*		- 22.6%		- 22.5%
Fullers Earth*		- 7.9%	1,652,590	- 6.9%
Portland Cement*		+ 33.5%		+ 34.6%
Limestone, Lime	313,744	+ 0.8%	364,713	+ 25.9%
Talc*		+ 418. %		+ 293. %
Slate*		- 69.8%		- 65.6%
Mica, Chlorite Schist*	12,382	- 10.5%	114,067	- 11.2%
Tripoli*		- 39.6%		+ 2.1%
Sand and Gravel	325,526	+ 31.8%	229,849	+ 84.6%
Barite*		+ 21.6%		+ 19. %
Ocher*	59,071	- 37. %	436,925	- 32.6%
Manganese*		+ 53.6%		+ 116.1%
Coal*		- 21. %		+ 3.9%
Iron Ore*	34,214	+ 264. %	93,845	+ 227. %
Kyanite*		+ 100. %		+ 100. %
Gold and Silver:				
Gold	969.91 fine oz.	+ 73.6%	33,898†	+ 137.7%‡
Silver	48. " "	- 26.2%	31	+ 34.8%
Total			\$ 8,155,813	+ 7.5%
Water Power			10,432,720	- 6.9%
Grand Total			\$18,588,533	- 8.1%

* Less than three producers, so production and value cannot be shown separately.

† Valued at \$34.95 per ounce. Value at old price of gold (\$20.671835 per oz.) would be \$20,049.79.

‡ Percentage increase is shown with 1934 production valued at \$34.95 per ounce and 1933 production valued at \$25.56 per ounce.

mentary kaolin was mined in 1934 in the following counties, named in order of the value of production: Wilkinson, Twiggs, Washington, Richmond, Hancock, Glascock, Baldwin, Houston, and Taylor. The 1934 production showed a marked increase over that of 1933, and preliminary estimates indicate that the 1935 production may be the largest in history.

Clay Products: The production of brick, sewer pipe, and tile from Georgia clays in 1934 showed a substantial increase over that of 1933, although it is still far below that of normal times. Common and face brick and structural tile are manufactured

treatment, are superior to fullers earth for bleaching oils were discovered in south Georgia in 1935 and are described in Information Circular No. 6 issued by the Georgia Division of Geology.

Gold: The production of gold in Georgia, which doubled in 1933, again nearly doubled in 1934. The principal production came from Lumpkin and White counties with minor amounts produced in Cherokee, Paulding, McDuffie, and other counties. About 15 mines were in active production during the year and prospecting or development work was carried on at other mines. It is estimated that the figures for 1935

will show a substantial increase over those for 1934.

Granite: The eight counties producing granite in 1934 are in order of the value of their production: Elbert, DeKalb, Warren, Madison, Gwinnett, Oglethorpe, Greene, and Carroll. The production from Elbert county is largely used for monumental purposes, whereas that from the other counties is largely used as curbing, rubble, road metal, railroad ballast, concrete aggregate, building stone, and other uses.

Iron Ore: Brown iron ore was mined in 1934 by two companies, one each in Bartow and Polk counties.

Kyanite: A small amount of kyanite, an aluminum silicate used in the manufacture of refractories, was produced for the first time in Georgia in 1933. The deposit, located in Habersham county, consists of a surface accumulation of kyanite crystals from a kyanite-mica schist. Mining continued in 1934 from this deposit and from a placer deposit of kyanite in the valley of a small stream in the same county. An investigation by the U. S. Geological Survey, in cooperation with the Georgia Division of Geology, resulted in the discovery of a large U-shaped belt of kyanite schists in Habersham and Rabun counties, as reported in Bulletin 46 of the Geological Survey of Georgia.

Lime and Limestone: The only plant reporting a production of lime in 1934 was in Bartow county. The five counties producing limestone, in order of value of their production are: Houston, Gilmer, Pickens, Whitfield, Bartow and Polk. The larger part of this production was used as a road material, but limestone, both crushed and ground, was used for many other purposes.

Manganese: Eleven companies in the Cartersville district of Bartow county, two in Polk county, and one in Floyd county reported production of manganese or manganese iron ore in 1934.

Marble: The Georgia Marble Company, with quarries in Pickens and Cherokee counties, was the only producer of marble in 1934. The production included a small amount of serpentine or verde antique.

Mica and Chlorite Schist: No production of scrap mica and only a small production of sheet mica was reported in 1934. Chlorite schist, used principally as a filler, was mined in Cherokee county.

Ocher: Ocher, a hydrated iron oxide used in the manufacture of linoleum, oil cloth, and as a coloring for mortars, was produced by two companies in the Cartersville district of Bartow county.

Sand and Gravel: Sand and gravel are produced at a number of small pits widely scattered throughout Georgia.

Talc: Two companies near Chatsworth in Murray county reported a production of ground talc and talc pencils used for marking iron and steel. The production for 1934 showed a very large increase over that of

1933. Early in 1935 a third company started production.

Tripoli: A small production of tripoli, used for abrasive and filler purposes was reported from a mine near the foot of Lookout Mountain in Chattooga county.

Water Power: The amount of electricity for public use generated by water power in Georgia in 1934 showed a slight decrease from that reported for 1933. The value was figured at one cent per kilowatt-hour, the approximate value of the electricity at the source of production.

Preliminary figures received indicate that the mineral production in Georgia in 1935 will show a substantial increase over the figures for 1934 given above.

U. S. BUREAU OF MINES PUBLICATIONS OF POSSIBLE INTEREST TO GEORGIA MINERAL PRODUCERS

BOUND VOLUME, MINERALS YEARBOOK, 1935.

This third issue in a series which supersedes the two-volume annual compilation, Mineral Resources of the United States, comprises 75 chapters, 129 illustrations, and 1,293 pages and constitutes a condensed library of current developments in the mineral industries. It covers the production of a hundred commercial minerals in the United States and abroad during the year 1934. Technical progress in the production of these minerals and their present economic position are reviewed. This volume continues the advances made in the 1934 volume and incorporates many improvements based on constructive suggestions volunteered by close observers and students of the mineral industry. In addition to accurate official data on all commercially important minerals, it gives a resume of the principal economic developments in mining, and deals with progress in coal utilization, uses of petroleum fuels, petroleum and natural gas production, mine safety, and mineral developments from a world viewpoint. Chapters on miscellaneous commercial gases and on minor non-metallic minerals appear for the first time. Recommendations of the National Resources Board and activity under the National Recovery Administration are reviewed in the commodity discussions. An analysis of the extent of business recovery for various mineral groups is given. Important occurrences in gold and silver mining and markets are thoroughly surveyed, and detailed reviews of activity in the metal mining districts of the various states are given. Sixty-one contributors are represented in the volume. 1293 pp. 129 figs. \$2.

Chapters from Minerals Yearbook, 1935

Copper, by J. W. Furness, Elmer W.

Pehrson, and H. M. Meyer. pp. 45-73. 5 cents.

Gold, silver, copper, lead and zinc in Eastern and Central states, by J. P. Dunlop and H. M. Meyer. pp. 237-258. 5 cents.

Radium, uranium, and vanadium, by Frank L. Hess. pp. 555-559. 5 cents.

Information Circulars

6869. Asbestos—Milling, marketing, and fabrication, by Oliver Bowles. pp. 2 figs. Third report in series on asbestos. This report deals chiefly with milling and marketing, although fabrication is so important brief references to principal processes are included. Free.

Mineral Market Reports

MMS 418. Portland cement industry in 1934—summary. 6 pp. Free.

Periodical Report Monthly

MTN Mineral trade notes (vol. 1, no. 6) 44 pp. Reviews current data on metals and industrial minerals (non-metallics) and includes statistical and general items that cannot readily be classified by individual commodities. Free.

These publications may be obtained from the Superintendent of Documents, Washington, D. C. If a charge is made, send either cash or money order. No stamps or checks accepted.

EARTHQUAKE FELT IN NORTH GEORGIA

Earthquakes have the reputation of striking more than once in the same place. On January 1, 1935, an earthquake of intensity 5 occurred near Shooting Creek North Carolina. Investigation by G. W. Crickmay and Lane Mitchell, assistant State Geologists, showed that it was felt over an area of 6,725 square miles, including parts of Tennessee and Georgia. Exactly a year later, on January 1, 1936, another earthquake shook this same general region. The tremor, first noted by the Blue Ridge Summit-Post, was reported by questionnaires sent out by the Division of Geology.

The 1936 tremor was felt at Blue Ridge Ellijay, and Cleveland, Georgia, at Isabella, Tennessee, and at Murphy, North Carolina. Its intensity probably did not exceed 3, as measured on the standard Wood-Neumann scale. Although it shook window and awakened some people, it was not strong enough to do any damage. The exact time of the earthquake is uncertain but was probably close to 3:00 A. M., Central Time. The 'quake was felt over an area of less than 1,000 square miles. The epicenter can not be located definitely because of insufficient data but probably was between Murphy, N. C. and Blue Ridge, Georgia, not more than 35 miles from the epicenter of the 1935 earthquake.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

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No. 3

TEACHING FORESTRY IN VOCATIONAL AGRICULTURAL SCHOOLS OF GREAT VALUE

JOINT EDUCATIONAL PROGRAM OF FOREST SERVICE AND
RURAL HIGH SCHOOLS APPROVED BY STATE
EDUCATIONAL LEADERS

(By M. D. Collins)

I am indeed glad that today in 199 of our schools where vocational agriculture is being taught, according to national leaders, we have the most unique and practical method of teaching forestry now in operation in the United States. This program of forestry education is being carried on by the Georgia Forest Service and the Division of Vocational Education of the State Department of Education. It is my understanding that Georgia was the first state in the Union to launch such a program. Since the program was started eight years ago, the Georgia plan, or one similar to it, has been developed in several other states.

Each year of the past eight, from four to seven thousand farm boys have been given practical training by vocational agricultural teachers in such jobs as constructing firebreaks, estimating standing timber, identifying trees, caring for seed beds, gathering tree seed, setting out trees, etc. The boys who study these jobs have projects at their homes where they actually put into operation the things they learn at school.

Each school has a tract of land of ten acres or more that is either owned by or leased to the school where correct forestry practices are carried out. The boys who study forestry in the schools receive actual practice in constructing firebreaks, cutting out undesirable trees, setting out trees, etc., on the school project. Management plans for the school forests are worked out by the district foresters of the state.

In order to encourage interest on the part of the boys studying forestry, the Georgia Forest Service provides a scholarship for one boy from each school in the state where agriculture is taught to attend the vocational forestry school camp, which is held annually. The scholarships are

(Continued on Page 2)

NEWLY APPOINTED STATE FORESTER ASSUMES DUTIES

Elmer E. Dyal, of Woodbine, Ga., was appointed state forester by the Commission of Forestry and Geological Development at a special called meeting on February 13. Mr. Dyal succeeds B. M. Lufburrow, who had been state forester for the past ten years.

Mr. Dyal has been superintendent of a Civilian Conservation Corps camp at Woodbine, Camden county, for the past three years, since this work was first established. He has had approximately ten years experience in forestry, lumber and naval stores work, and is well qualified to fill the position.



ELMER E. DYAL
State Forester

GEORGIA'S FOREST WEALTH

Georgia, with 23,750,000 acres of potential forest land within her borders, holds first place among the states of the Union in forest acreage. This vast acreage represents 63 per cent of the total land area. Forest products rank second as the source of revenue, being only exceeded by agricultural products.

Within her borders 163 species of trees are to be found. No other state has a wider botanical range of plant life, and only Florida has a greater number of tree species.

The forests have been Georgia's greatest NATURAL source of income, and promises to hold this position. According to the last government census on turpentine and rosin, Georgia leads all other states in naval stores products. In 1933 there were 449 naval stores operators, employing 13,251 persons, with a total of \$2,684,000 paid in wages. In 1934 Georgia ranked fourth in the number of active lumber mills in operation, sawing a total of 476,221,000 board feet of lumber; only nine other states sawed a greater number of board feet of lumber in 1934.

In 1934 Georgia's lumber, laths and shingles cut amounted to 473,167,000 board feet, produced from the following species: cedar 281,000; cypress 7,400,000; yellow pine 412,737,000; ash 5,643,000; chestnut 56,000; cottonwood 2,665,000; elm 370,000; magnolia 336,000; maple 450,000; oak 10,613,000; red gum 15,520,000; tupelo 5,484,000; yellow popular 10,913,000; all others 699,000.

A total of 3,905,000 laths were cut during 1934 and 1,087,000 squares of shingles. There were 210 lumber and timber products establishments whose output was valued at \$6,950,000, with an added value by manufacturing of \$4,293,000; also 53 planing mills whose output was valued at \$2,548,000 with an increased value by manufacturing of \$961,000.

During the same year the value of turpentine and rosin was \$8,617,000, being increased in value by manufacturing by \$5,178,000. Wood preserving was also an important business, bringing to Georgia an income of approximately \$1,625,000, increased by manufacturing by \$533,000.

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

CHIEF FORESTER REVIEWS SIXTY YEARS OF GOVERNMENT FORESTRY

The United States Forest Service celebrated its thirty-first birthday February 1. Commenting on this, F. A. Silcox, Chief of the Forest Service, pointed out that 1936 is also the sixtieth anniversary of the Government's first step in forestry.

"I am sure," Mr. Silcox said, "that we may consider this birthday anniversary of the Forest Service one of the important milestones in the development of American forestry. Through the past year's manifestation of the capacity of the forests for absorbing labor on productive and non-competitive projects, we are materially helped along our way toward that time when the forests, managed for continuous yield of their resources, can be counted upon to protect and sustain their share of the economic and social life and the happiness of millions of Americans.

"America is a forest nation," the Chief Forester declared. "The first emblem chosen by our Nation's forefathers was the Pine Tree flag. Our forest resources contributed in large measure to the upbuilding of the country. The story of our progress is inseparably linked with our forests.

"But we have been prodigal with our forest wealth. We are living in a period when conservation of our forest resources is regarded as a principle more than a function—of government. Between 1936 and 1876, which date marked the definite entry of the government into the field of forest conservation, lies a dramatic story dealing with men who labored for the preservation of one of our basic resources of national security."—News Release, U. S. Department of Agriculture, Washington, D. C.

FORESTRY IN AGRI. SCHOOLS

(Continued from Page 1)

awarded to the boys who make the best grades on a written examination and who do the most outstanding work on their home projects.

We are indeed glad that Georgia has pointed the way in this splendid forestry educational program and I hope that the day will soon come when we will have such a program of forestry education in each of the 1,500 schools serving rural boys.

I have been told by persons in a position to know that the forest products marketed in Georgia amount to approximately \$125,000,000 annually, and rank next to the agricultural crops in total value for the state. I have also been informed that trees grow faster in Georgia and the south than in any other section of the nation. Through authorities, I have learned that the forest losses, as a result of fires and other wasteful practices, amount annually to approximately \$7,500,000 in Georgia.

If the above statements are true, and I have every reason to believe they are, then Georgia, where trees grow so rapidly, has great potential possibilities in improving and developing the forest areas.

I have been asked this question, "What part should education play in the program of developing our forest resources and improving our present practices?" In reply, I would say that, generally speaking, the progress and development of any industry depends largely upon the people who go into it and the sort of training they have. If, through an educational program, we can bring about a consciousness on the part of the people that we have great potential possibilities in developing our forest areas and a desire on their part to protect their forests from fires and other wasteful practices, we will not have to worry about the future of forestry in Georgia.

It is rather difficult to say just what part the public schools should play in such an educational program. At the present time I doubt if a very large per cent of our teachers are prepared to teach many of the technical problems involved in good forestry methods. Many could, however, give general information regarding our forest resources and the destruction caused by fire.

The first step in any educational program carried on in connection with public schools is that of training teachers for the special information to be given. A large army of teachers might be given general and practical training in forestry in a very short time if the heads of the various Teacher Training Institutions were convinced that such a program is greatly needed in the state. I am suggesting this idea with the thought that those interested in the development of our forestry resources, and who are more familiar with the problems pertaining thereto, might give more consideration to this matter.

WHO BURNS THE WOODS?

In an effort to fix the responsibility for forest fires—not on the individual—but on the class of individuals responsible for much of the avoidable woods burning—the following figures assigning causes of forest fire have been compiled by the statistical division of the U. S. Forest Service:

Causes of Fires	No. in 1934	Percent
Incendiary	12,439	44.0
Smokers	4,099	14.5
Debris Burning	3,436	12.0
Unknown	3,146	11.0
Miscellaneous	2,285	8.0
Campers	1,393	5.0
Railroads	798	3.0
Lumbering	493	1.7
Lightning	219	.8
	28,308	100.0

Considering the money value only of the forests, the loss is appalling, especially when we note that the above figures do not mean the number of acres burned over, not the number of trees destroyed, but the number of fires which occurred over a given area, each fire destroying many acres of trees.

If the above figures represented the number of trees destroyed, and each tree worth \$1.00, it would mean a loss of \$28,308; but if 100 trees only were destroyed in each fire, at a value of \$1.00 per tree the loss would be in round figures \$2,830.800.

Looking casually at the causes of forest fires, out of the nine causes listed, five of them could be avoided by using caution. This includes those wilfully set, which heads the list. When trees are of so much value, and still the woods are burned, we wonder of what use is education. Smoke debris burners, campers and sawmill operators by exercising care can bring down figures such as these to a minimum, and it is believed that with the need for preservation of this valuable natural resource, more care will be exercised in future. There is no excuse for wilful burning, and the judges and juries of various states, particularly in Georgia, are giving heavy sentences to those convicted of setting fire to the woods.

Education of the people has shown that it is no longer necessary to burn the woods to destroy ticks, boll-weevils, etc.

The comparatively small number of fires caused by railroads and sawmills in the area covered by these figures (11 states) shows that precaution is being used to protect these interests to prevent woods fires.

Individual responsibility for careful putting out all camp fires, brush burning fires, and for seeing that cigarette ends and cigar ends are dead before being thrown into dry grass or trash, is urged on every citizen, especially those who enjoy the woods.

FOREST CONSERVATION

By TOMMY GINN, Royston, Ga.

Student of Bowman High School Wins Second Prize in GFA Contest

Like many other sections of Georgia, my locality has been stripped almost bare of timber large enough to be of much use. It makes me shudder to think of the conditions that will some day exist unless we show more precaution in regard to what remains of our woodlands. When we have confiscated all the wooded areas at our disposal, floods, drouth and famine will follow eventually.

As a nation we pride ourselves upon the high standard of living we have developed in the last century, but unless we do something about this destruction of our forests, the wonderful inventions science has given us will be of no avail. The future of civilization depends not so much upon science as upon the conditions of this globe on which we live.

Speaking of conditions, Elbert county has fared better than some of her neighbors during this ruthless destruction of our forests. Large sawmills have long since ripped up the virgin forests that once covered almost the entire southern part of the state. The soil on some of these deforested areas being sandy, has suffered badly from erosion, whereas the extreme northern part of the state has retained most of its natural covering. The land being rough, mountainous and inaccessible has discouraged lumbering and farming.

Like the danger signal given by the human body just before the striking of an impending catastrophe, prevailing conditions, it seems, have at last attracted attention to this folly of destruction with utter disregard to the future. Like human ills, this impending shortage of natural resources can be prevented by prompt treatment. Not only can we prevent a very undesirable situation by a step in the right direction, but by the same effort we can increase our future income with very little difficulty.

As you probably know, Dr. Chas. H. Herty, through his experiments, has opened up an unlimited future in the growth of the slash and other pines in Georgia. The areas of worn out soil that I see dedicated to the growth of young pines indicates the turning point in this waste of natural resources.

The Future Farmers of America chapter at Bowman, Ga., has a four acre plot of two year old pines which are growing nicely. This plot located on one of the largest and reddest mounds of earth in Elbert county, will have an excellent chance to prove its value in the prevention of soil erosion. This interest of the Bowman chapter in forestry does not stop with a class project. Some of the boys have a project

of their own where they practice the things they are taught in class.

If we could get the public sufficiently interested in this reforestation program, it might be possible in time to restore some of the wild life that once roamed our land. What could be more ideal than each farm with its own game preserve?

The real success or failure of reforestation depends, I believe, more upon the individual's attitude than upon government action.

INCREASED REFORESTATION

The reforestation program of the federal government set a new record in 1935. No such gigantic program has ever before been attempted.

Beginning on government owned lands—the national forests—the program has covered the reforesting of approximately 244,000 acres, which was three times as much national forest land as was reforested in 1934. This work has been done to a very great extent by the CCC camps and persons on the relief rolls.

The reforestation program in Georgia has taken on new impetus in 1935 and all the seedlings raised in the two state nurseries have been sold—in fact, the demand exceeded the supply for some species. The number produced in the nurseries operated by the Georgia Forest Service, one at Blairsville and one at Albany, was more than four times the amount produced in 1934. The following table gives the figures for both years:

Species	Grown in 1934	Grown in 1935
Black walnut	12,233	23,000
Black locust	8,000	17,600
Loblolly pine	217,060	906,000
Longleaf pine	43,910	597,000
Slash pine	485,750	1,566,900

Total	766,953	3,110,500
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The Georgia Forest Service nurseries will produce considerably over 5,000,000 seedlings of all kinds in 1936.

FORESTRY WORK HINDERED BY RAIN AND SNOW

The recent freakish weather in Georgia has slowed down State Forest and Park work to a great extent. Much time has necessarily been lost in CCC camps on account of swollen streams, blankets of snow and cold weather. These conditions prevailed mainly in the northern part of the state, while south Georgia suffered from heavy rains.

Although such weather is an aid in the prevention of forest fires, the tendency of campers and others to build warming fires and leave them unextinguished largely offsets any conditions favorable to fire prevention.

FORESTRY SLOGANS

The dictionary defines "slogan" as "the cry of a clan; a war cry; any rallying cry."

Forestry slogans, therefore, would be a war cry against the common enemy of the forest—fire—and a rallying cry of those who love the forest and are its defenders.

W. R. Mattoon, Extension Forester for the U. S. Forest Service, with headquarters in Washington, D. C., has compiled a number of slogans, a few of which we list below. These slogans are used on placards which are scattered throughout the national forests and parks, for the admonition of campers, smokers, and any who use fire in any way while going through the forests. These forests and parks are for the pleasure of the public, and certainly the public should in turn assist in their protection.

Some of these slogans are:

Prevent forest fires—It pays.

A tree will make a million matches; a match may destroy a million trees.

Matches alone are not dangerous—it's the man.

Insure against fire, and banks will lend money on young, thrifty, growing pine trees.

Woods fires are man-made; therefore, can be prevented.

Nature wants to work for you and yours, and me and mine. Why not let her? PUT THAT MATCH OUT.

FOREST FIRES DESTROY LUMBER, INJURE LABOR, KILL INDUSTRY, ROB THE COMMUNITY AND INCREASE TAXES.

Sowing matches, reaping ashes; don't make light of the match.

A cigarette may be down but not out. Save the forests.

The time to put a fire out is before you drop the match.

Cigarettes are irresponsible; don't let them go out alone. Use caution—it beats blazes.

A careless smoker is a fire provoker; park your sparks carefully and save the forests.

This is God's country; don't set it on fire and make it look like Hell.

The man who burns his woods to get rid of the boll weevil might just as well burn his barn to get rid of rats.

Fire burns the ground cover, the home of wild animals and birds.

Fire burns the food of animals and birds. Animals and birds cannot survive without food.

Shady roads! Fire kills roadside trees; ride in the shade by keeping out fires.

Hunters! Fires drive away the game. A person who thinks won't burn the woods.

Good sense is worth more than books.

FIRST DISTRICT

**T. P. Hursey, Dist. Forester,
ROME**

Seven vocational agricultural schools in this district have been visited in the past few weeks, with a view to checking on the work they are doing in forestry. I find both teachers and students showing considerable interest in the forestry program, and believe as the spring opens up and more outside work can be done, renewed interest will be manifested.

Weather conditions, causing impassable roads in some sections, have prevented my visiting more schools.

I have visited 25 grammar schools in Floyd, Chattooga, Walker, Dade, Catoosa, Whitfield, Gordon, Pickens and Cherokee counties, and find that they are teaching a simple forestry program in these schools, which will be developed on a larger scale when the pupils enter higher grades in these schools.

T. P. O. Notes

Lookout Mountain TPO has dissolved as such, but the members have joined with Walker County TPO and Chattooga County TPO respectively, and the actual fire protection work will not suffer. Additional acreage will be reported as secured. Rowland Hemphill is the new secretary-manager of Chattooga County T. P. O.

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

Educational work with vocational schools has been carried on with considerable success this winter. Many of the teachers are very interested in their forestry programs. Due to bad weather for the last two months, not all schools have been visited, but plans have been made to visit all schools in the Gainesville district before March 15.

**Vocational Teachers Initiate
Planting Program**

An attempt has been made by the district forester to secure the aid of vocational teachers in a planting program in the community around each school, and this plan is meeting with cooperation from the teachers, and others. No attempt is made by the district forester to promote the sale of seedlings, the idea being that farmers or land owners, through the aid of vocational teachers, may be able to secure seedlings for planting purposes by growing them in seed beds, by purchase, or by digging them in the woods. Each vocational teacher visited is asked to estimate how many seed-

lings he thinks can be successfully planted in his area next planting season.

It is the belief of the district forester that a planting program sponsored by each school and cooperated in by the surrounding land owners, will greatly aid in the development of forestry education, as well as timber growing.

The following teachers have agreed to promote the planting of areas near their schools next planting season:

H. L. Ariail, Grayson High, Grayson, Ga., 5,000 seedlings.

W. C. Britt, Snellville High, Lawrenceville, 10,000 seedlings.

J. H. Mitchell, Baldwin High, Baldwin, 5,000 seedlings.

W. L. Green, Eastanollee High, Eastanollee, 25,000 seedlings.

T. S. Porter, Line No. 1 Consol., Martin, Ga., 10,000 seedlings.

Other teachers will be visited soon, and their names and the number of seedlings to be planted will be given next month.

SIXTH DISTRICT

**W. G. Wallace, Dist. Forester,
Savannah**

Coastal T. P. O. Organized

On February 6th a meeting was held at New Southport in McIntosh County for the purpose of organizing the Coastal T. P. O. Charter membership consisted of eight individual landowners listing a total of 54,507 acres, the entire block being exceptionally well blocked in.

Officers and directors are as follows:

Albert Ernest, President and Director

C. C. Stebbins, Vice-President and Director.

G. T. Wegner, Secty-Treas. and Director.

S. D. Nelson, Director

C. C. Townsend, Director.

A full time T. P. O. Manager, Mr. Charlie Hooper, has been employed on a full time basis. Under him are two patrolmen, Mr. Robert Hobbs and Mr. George Nelson. Fire fighting equipment is being purchased as recommended by the Georgia Forest Service.

It is expected that this will be a very active organization. Present plans call for intensive forest management as well as fire control. It is hoped that the services of the CCC may be secured sometime in the future to assist the T. P. O. in developing a fire protection system.

**Oconee T. P. O. Purchases
Firebreak Equipment**

At a recent meeting of the Oconee TPO Board of Directors, called by Mr. J. E. Hall, Secty-Treas., contract was made for the early delivery of a Caterpillar Deisel tractor and plow, for maintaining ECW

primary firebreaks and constructing secondary firebreaks.

Due to lack of T. P. O. equipment, many individual members have already maintained and constructed necessary firebreaks on their own land. The new equipment will be used for unfinished work remaining to date, and for all T. P. O. work beginning in the late summer.

Mr. James Fowler, together with the Board of Directors, is to be congratulated on making this forward permanent step towards efficient fire protection. Mr. J. J. Walker has been appointed T. P. O. Manager to succeed Mr. R. P. Marsh who recently resigned this position to accept a similar position in the Waycross District.

**TWO OUTSTANDING
VOCATIONAL LEADERS PASS**

During the week of February 8-14 two of the nation's outstanding leaders for Vocational Education passed away. They were Dr. H. O. Sargent, Federal Agent for Agricultural Education in Negro Schools, and R. D. Maltby, Southern Regional Agent for Agricultural Education.

According to statements from numerous educators, the vocational forces have lost two able and conscientious workers. Both had served in the Smith-Hughes work since its beginning in 1917. They were well known and highly regarded by a host of friends throughout Georgia, most of whom are engaged in vocational work.

Mr. Maltby had been in ill health since the early part of November. Dr. Sargent was seriously injured in an automobile accident while on official duty in the State of Louisiana. His death came a few days later after he had contracted pneumonia.

Mr. Maltby was Georgia's first State Supervisor for Vocational Agriculture. He was very instrumental in organizing the Vocational Program in the state. In 1920 he became Federal Agent for Agricultural Education for the twelve Southern States which position he held until the time of his death. Under Mr. Maltby's supervision the number of Vocational Agricultural Departments in the high schools in the Southern States has grown from a little more than 300 with an enrollment of 1500 pupils to 1837 schools with an enrollment of more than 140,000.

Dr. Sargent was reared near Russellville, Ala. He was placed in charge of the work in Agricultural Education for Negroes in October, 1917. He was a graduate of the Alabama Polytechnic Institute at Auburn. He was regarded as probably the most outstanding man in the United States in his particular work. As a result of his efforts, great improvements were made in giving practical training in the negro schools of the South.

MYRON AVERY ADDRESSES GEORGIA APPALACHIAN TRAIL CLUB

Myron H. Avery, Washington, D. C., sportsman and chairman of the Appalachian Trails Conference, gave an illustrated lecture before the Georgia Appalachian Trail Club Friday night, February 21, 1936.

Mr. Avery illustrated his talk with pictures of the Appalachian Trail from its start at Mount Katahdin in Maine to its southern terminus at Mount Oglethorpe in Georgia. He told of the different problems besetting the local clubs in each section in

although the trail is adequately maintained and 4 overnight cabins have been constructed, pictures of these improvements had not been sent to Mr. Avery as he had requested.

Carter Whittaker, President of the Club, presided and he told of a new program of trail maintenance for 1936 and promised Mr. Avery a better supply of pictures of the Georgia Trail.

THE BATTLE BRANCH GOLD MINE, AURARIA, GEORGIA

Geological investigations of a strictly economic nature frequently lead to conclusions of more purely scientific character, particularly conclusions relating to the genesis of ore deposits and to the principles of ore deposition. A correct understanding of these principles and the conditions which localize an ore shoot are, however, often of immense aid to successful development. In a recent paper on "The Battle Branch Gold Mine, Auraria, Georgia", C. F. Park, Jr., and R. A. Wilson give some of the results of an investigation of the Georgia gold deposits undertaken in 1933-1935 by the U. S. Geological Survey under an allotment from the Public Works Administration. The conclusions which these authors reach as to the origin and sequence of mineral deposition apply particularly to the Battle Branch mine in Lumpkin County, but the same general conditions prevail in many of the other mines and prospects in the region. For this reason many operators will find in this paper helpful information in answering that age-old question "Why is gold where it is?" Copies of the paper, published in *Economic Geology*, vol. 31, pp. 73-92, may be obtained from the State Geologist for the cost of printing. (10 cents).

The Battle Branch lodes consist of quartz stringers and lenses grouped in three zones in a schistose phase of the Carolina gneiss, which is itself silicified and mineralized. The lodes are persistent with depth but pinch and swell abruptly. The pod-shaped ore shoots are localized by the intersection of joints and fractures with the main lode. Fracturing occurred before, during, and after mineralization. These fractures are most abundant where the rocks have been bent around massive quartzite lenses. The general conclusion is that the sharper the flexure the more numerous the fractures, and the more numerous the fractures the better the grade of ore.

The mineralogy of the deposit is unusual in that such minerals as garnet, cumingtonite, tourmaline, kyanite, chlor-apatite, pyrrhotite, galena, and gold are intimately associated. The deposit is clearly a high-temperature lode of hypogene (deposited by ascending hot solutions) origin. Three stages of mineralization are distinguished.

The first stage was characterized by the formation of coarsely crystalline silicates, pyrrhotite. The third and final stage saw the deposition of chlorite, galena, and gold. The best indicators of rich shoots are galena, red garnet, and ankerite, but it is uncertain if this rule has general application.

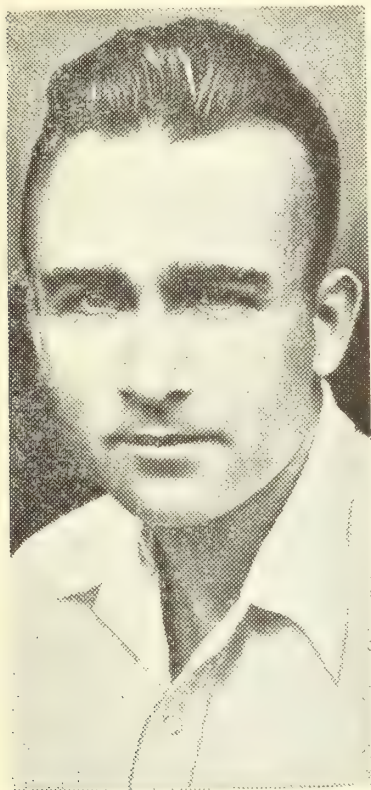
A surficial oxidized zone as much as 80 feet deep consists of quartz stringers in saprolite. It is concluded that the gold in the upper part of the saprolite has been enriched mechanically but the deeper gold ores are considered to be entirely hypogene and not enriched by downward-percolating waters. No definite statement can yet be made as to possible change in grade of ore with depth for the Battle Branch mine, only 130 feet deep, is the deepest accessible mine in the region.—G. W. C.

CONCENTRATION OF GEORGIA KYANITE ORE DESCRIBED AT MINING ENGINEERS' MEETINGS

A paper on the concentration of Georgia kyanite ore was presented at the annual New York meeting of the American Institute of Mining and Metallurgical Engineers on February 17th by R. G. O'Meara and B. W. Gandrud of the Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Alabama. This paper gives the preliminary results of tests now in progress by the Bureau of Mines on samples of massive kyanite and kyanite schist from Habersham and Rabun counties, Georgia. By classification and table concentration of a schist ore containing nine per cent kyanite, 67 per cent of the mineral was recovered assaying 90 per cent kyanite. Both ores and their table middlings are amenable to flotation and this process is necessary to raise the grade of concentrate above 95 per cent and to improve the recovery.

Richard W. Smith, State Geologist of Georgia, in discussing the paper at the meeting pointed out the need for further research on both the beneficiation of kyanite and its use in refractory and ceramic bodies. Particular attention should be paid to possible by-products from the kyanite schist, such as flake mica for the artificial roofing trade, and garnet for abrasive use. Mr. Smith stated that one Southern refractories manufacturer has experimented on the use of Georgia kyanite and has successfully developed a high alumina refractory body using about 50 per cent Georgia kyanite. The kyanite for this use does not need to be particularly low in iron or free silica and therefore would require less beneficiation.

Copies of this paper may be obtained from the State Geologist for five cents in stamps.—R. W. S.



MYRON H. AVERY

the maintenance of the trail and the preservation of its wilderness character. Describing the wildness of the Maine mountains he stated, "Sometimes sudden blizzards in mid-summer catch the hiker unawares and make his return to civilization extremely hazardous."

The pictures of the splendid cabins and accommodations maintained by the northern clubs for the travelers were very impressive. When Mr. Avery spoke of the increased interest in skiing and stated that the sport was becoming popular as far south as Washington, D. C., he expected to surprise his audience. The tables were turned, however, when to his astonishment pictures were shown of the Georgia club engaging in all the winter sports during the recent cold spell.

The lack of pictures of the 100 miles of the trail in Georgia was a source of some embarrassment to the Georgia club, for

FROTH FLOTATION OF BARITE

In 1934, crude barite was mined in Georgia, Missouri, California, Nevada, South Carolina, Tennessee, and Virginia. Georgia has in the past been the leading producer in the United States and is now second only to Missouri. The Georgia deposits occur only in the Cartersville district associated there with deposits of ochre and manganese. The total production of these minerals from the district was nearly \$500,000 in 1934. Georgia crude barite has commanded a better average price than barite from other states, but all domestic barite must compete with imported barite which has the advantage of low delivery costs, and softness and purity of product. Imports of barite totalled \$175,000 in 1934 or only 16% of total consumption. However, domestic production could probably be increased by introducing milling methods which insured a product of standard purity. With this end in mind, R. G. O'Meara and G. D. Coe of the Southern Experiment Station, U. S. Bureau of Mines, have made experiments on the "Froth Flotation of Southern Barite Ores", and presented their results before the New York meeting of the American Institute of Mining and Metallurgical Engineers Feb. 17, 1936. Flotation has long been successfully practiced in the separation of metallic ores and recently has been applied to the recovery of nonmetallic minerals. O'Meara and Coe used different types of reagents on various ores and found that flotation could be easily controlled and permitted considerable leeway in manipulation. The process is applicable particularly to those deposits which contain variable amounts of such impurities as iron, quartz, lime, and fluorite, for a uniform product can be assured. The successful application of the laboratory tests to practice seems possible. If milling costs can be reduced flotation may well become the standard method for concentration of crude barite. Georgia ores are not favored, however, for the methods can be applied to deposits in many states.—G. W. C.

FROM A GEOLOGIST'S NOTEBOOK

State Geologist, Richard W. Smith, attended the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 16-20. At the meeting, Mr. Smith took part in the organization of the Industrial Minerals Section of the Institute. He also discussed a paper on "Concentration of Georgia Kyanite Ore" by R. G. O'Meara and B. W. Gandrud, a review of which is given in another section of this issue. A review of a paper on barite concentration, presented at the same meeting, is also given.

At a meeting of the State Geologists' held in Washington, D. C., following the A. I. M. E. meeting, the subject of a permanent plan of topographic mapping was discussed. Mr. Smith stated that the hoped-for program had not yet materialized, although attempts are still being made to secure funds for the purpose.

Lester B. Forbes addressed the Georgia Mineral Society at its February meeting on "The Story of Asbestos". Pictures and specimens were shown. Dr. A. C. Hawkins was announced as the speaker for the meeting on March 2. "Mineral Collecting" will be his subject.

H. S. Ladd, new geologist for this region of the State Park Division of the National Park Service, is planning to further interest in geology and mineralogy in Georgia State Parks. He plans a number of markers at spots of unusual interest.

GEORGIA MINERAL DIRECTORY 1935

BARITE

Bartow County

Georgia Barium & Ochre Co.,
Frank D. Smith, Gen. Mgr.,
Formerly R. K. Miller Minerals Corp.
Cartersville, Georgia

New Riverside Ocher Co.,
J. R. Dellinger, Sec. & G. M.,
Cartersville, Georgia

Paga Mining Co.,
H. W. Smith, Sec. & Treas.,
Cartersville, Georgia

BAUXITE

Sumter County

Benjamin Easterlin
Americus, Georgia
Mine at Andersonville, Ga.

Americal Cyanamid & Chemical Corp.
New York, N. Y.
Mine at Andersonville, Ga.

PORTLAND CEMENT

Houston County

Pennsylvania-Dixie Cement Corp.
James Building
Chattanooga, Tenn.
Quarry at Clinchfield, Ga.

Polk County

Georgia Cement & Products Co.,
Ralph E. Nicholson, V. P.,
Martin Bldg.
Birmingham, Ala.
Quarry at Portland, Ga.

Southern States Portland C. Co.,
B. Cowden, Sec.,
Rockmart, Georgia

CLAY

Kaolin for filler or white ware use.

Richmond County

Albion Kaolin Co.,
W. E. Thatcher, Treas.,
320 Broadway, New York, N. Y.
Mine at Hephzibah, Ga.

Taylor County

Carolina China Clay Co.,
Butler, Georgia

Twiggs County

Moore & Munger
33 Rector St., New York, N. Y.
Mine at Dry Branch, Ga.

Georgia Kaolin Co.,
433 N. Broad St., Elizabeth, N. J.
Mine at Dry Branch, Ga.

B. D. Tharpe
Dry Branch, Ga.

Wilkinson County

P. W. Martin
Gordon Clays, Inc.,
Gordon, Georgia

Savannah Kaolin Co.,
314 American Bldg.,
P. O. Box 348, Savannah, Ga.

Mine at Gordon, Ga.
Hatfield & Owens
Gordon, Georgia
Mine at Ivey, Ga.

Akron Pigment Co.,
Cartersville, Ga.
Mine at McIntyre, Ga.

Hall-Stevens Products Co., Inc.,
McIntyre, Georgia

Edgar Bros. Co.,
H. T. Edgar, Treas.,
Station Place, Metuchen, N. J.
Mine at McIntyre, Ga.

H. A. Walden
McIntyre, Ga.

Walkers' Georgia Kaolin Mines
McIntyre, Georgia

CLAY

Kaolin for refractory use.

Baldwin County

General Refractories Co.,
106 So. 16th St.
Philadelphia, Pa.
Mine at Stevens Pottery, Ga.

Glascok County

Harbison-Walker Mining Co.,
Farmers Bank Bldg.,
Birmingham, Ala.
Mine at Gibson, Ga.

Hancock County

Dixie Fireproofing Co.,
W. P. Stevens, Pres.,
Macon, Georgia
Mine at Carrs Station, Ga.

Alwynne O. Hutchings
Carrs Station, Ga.

Oconee Clay Products Co.,
Milledgeville, Ga.
Mine at Devereux, Ga.

Wilkinson County

Gordon Kaolin Co.,
F. H. Oppen, Pres.,
314 American Bk. Bldg.,
Savannah, Georgia
Mine at Gordon, Ga.

Harbison-Walker Mining Co.,
Farmers Bank Bldg.
Birmingham, Ala.
Mine at Gordon, Ga.

CLAY

Miscellaneous clay.

Chattooga County

William J. Seas,
Tennessee Valley Mineral Co.,
R. F. D. No. 3,
Summerville, Ga.

Floyd County

Oconee Clay Products Co.,
Milledgeville, Georgia
Mine at Rome, Georgia

Upson County

W. A. Gilreath
Thomaston, Ga.

COAL

Walker County

Durham Land Co.,
Chattanooga, Tenn.
Mine on Lookout Mountain

FULLER'S EARTH

Decatur County

Attapulugus Clay Co.,
260 So. Broad St.,
Philadelphia, Pa.
Mine at Attapulugus, Ga.

Twiggs County

General Reduction Co., Inc.,
Macon, Georgia
Mine at Dry Branch, Ga.

Wilkinson County

Hall-Stevens Products Co.,
J. M. Hall, Pres.,
McIntyre, Georgia
Mine at Toombsboro, Ga.

Thomas County

Mineral Products Co.,
Hazen E. Butler, Man.,
Ochlochnee, Georgia

GOLD

Note: The following is a partial list of the gold operations of Georgia in 1935. Complete information was not available. There were doubtless other producers on a small scale who did not report their workings to this office. It is possible, also, that some larger development operations were inadvertently omitted from mention. Those mines marked with asterisk ceased operation in 1935.

Cherokee County

*301 Mining Co.,
Dr. W. A. Selman, Pres.,
157 Forrest Ave., N. E.
Atlanta, Georgia
Mine at Holly Springs, Ga.

Dawson County

Saga Mining Co.,
S. P. Cronheim, Pres.,
65 Forsyth St., N. W.
Atlanta, Georgia
Mine at Dawsonville, Ga.
G. E. Russell, Mgr.
138 Marietta St., N. W.
Atlanta, Georgia

Gwinnett County

Sugar Hill Mine
Mr. Dukes, Mgr.
Flowery Branch, Ga.
Mine near Buford

Lumpkin County

Battle Branch Mine
Southern Minerals Development Co.,
R. A. Newton, Mgr.,
Box 116, Dahlonega, Ga.
Mine at Auraria, Ga.

*Barlow Mine

Carey, Inc.,
Reg. A. Brett, Supt.,
Dahlonega, Ga.

Topabri Mine

Bartlett F. Johnston, Mgr.,
Dahlonega, Georgia
Mine at Auraria, Ga.

McDonald Mine

Carl McDonald, Mgr.,
Dahlonega, Ga.

Long Branch Mine

Ranald Gold Mining Co.,
W. R. Shillington, Mgr.,
Dahlonega, Georgia

Bunker Hill Mine

Robert H. Reid
Dahlonega, Ga.

Whim Hill Mine

Reliance Development Corp.,
P. G. Jacobson
E. Samuelson
F. Lindberg
Auraria, Ga.

Findley Ridge Mine

Cornelius O'Kane, Owner
New York, N. Y.
Mine at Dahlonega, Ga.

McDuffie County

Fluker Mine
W. H. Fluker, Mgr.
Thomson, Ga.
Mine 12 miles N. W. of Thomson

Paulding County

Yorkville Mine
J. S. Colbert, Mgr.,
Rt. 4, Dallas, Ga.
Mine at Yorkville, Ga.

Rabun County

Stonecypher Mine
F. M. Dancy, Mgr.
Clarksville, Ga.

White County

Loud Mine
G. C. Dugas, Supt.,
Cleveland, Ga.

Franco-American Mine,
Reg. A. Brett, Supt.,
Helen, Ga.

Reynold's Placer Mine
Mr. Reynolds,
Nacoochee, Ga.

Asbury Placer

F. R. Switzer
Cleveland, Ga.

Bean Creek Mine

T. J. Stevenson
Sautee, Ga.

Hudson Mine

W. C. Hudson
Helen, Ga.
Mine near Nacoochee, Ga.

Dunbar Mine

C. L. Dunbar
Nacoochee, Ga.

H. L. Schwalbe

3211 Bull St.,
Savannah, Ga.
Mine near Nacoochee, Ga.

Poland Mine

C. O. Polard
Cleveland, Ga.
Mine near Cleveland, Ga.

GRANITE

Carroll County

W. N. Harris
163 Clifton St., N. E.
Atlanta, Georgia
Quarry at Villa Rica, Ga.

DeKalb County

Consolidated Quarries Corp.
G. A. Austin, Gen. Mgr.
Bona Allen Bldg.
Atlanta, Georgia
Quarry at Lithonia, Ga.

Davidson Granite Co.,
J. K. Davidson,
Lithonia, Georgia

Pine Mountain Granite Co.,
1219 Citizens & Southern Bank Bldg.,
Atlanta, Georgia

Quarry at Lithonia, Ga.
Stone Mountain Crushed Stone Co.,
Stone Mountain, Georgia
Quarry at Lithonia, Ga.

Stone Mountain Granite Corp.,
Stone Mountain, Georgia
F. Weiblen, Pres.,
Quarries at Lithonia &
Stone Mountain, Ga.

Wilson-Chapman Granite Co.,
Box 114
Lithonia, Georgia

Ethel Granite Co.,
Stone Mountain, Ga.

Elbert County
T. T. Coogler Quarries
Elberton, Georgia
Empire Granite Co.,
Elberton, Georgia

Elberton Granite Industries
Elberton, Georgia

Liberty Granite Co.,
Box 721
Elberton, Georgia

Mercer Granite Co.,
Elberton, Georgia

Allen Granite Co.,
American Granite Quarries
Elberton, Ga.

Oglesby Granite Quarries, Inc.,
Elberton, Georgia

J. C. Wessemger, Jr.
Southern Quarrying Co.,
Elberton, Georgia

Southeastern Granite Co.,
Elberton, Georgia

Fannin County
Fannin County,
Highway Dept.,
Blue Ridge, Ga.

Greene County
Greensboro Granite Co.,
Greensboro, Georgia

Gwinnett County
Gwinnett County
Highway Dept.,
Lawrenceville, Ga.

Lumpkin County
W. N. Harris
163 Clifton St., N. E.
Atlanta, Ga.
Mine at Dahlonega, Ga.

Madison County
Piedmont Granite Quarries, Inc.
876 Confederate Ave., S. E.
Atlanta, Georgia
Mine at Carlton, Ga.

Madison County
C. M. Lyle Construction Co.,
Jackson Bldg.,
Gainesville, Ga.
Mine at Danielsville, Ga.

Oglethorpe County
Union Curb Co.,
Salisbury, N. C.
Mine at Carlton, Ga.

Warren County
The Weston & Brooker Co.,
Columbia, S. C.
Mine at Warrenton, Ga.

IRON ORE

Polk County
Cedartown Iron Co.,
Anniston, Ala.
Mine at Cedartown, Ga.

Bartow County
H. H. Quinn
Cartersville, Ga.

KYANITE

Habersham County
Georgia-Carolina Minerals Corp.
Philip S. Hoyt, Mgr.,
Franklin, N. C.
Mine at Clarkesville, Ga.

LIME

Bartow County
Ladd Lime & Stone Co.,
Cartersville, Georgia

LIMESTONE

Bartow County
Ladd Lime & Stone Co.,
Cartersville, Ga.

Bleckley County
Georgia Lime Rock Co.,
P. O. Box 578
Ocala, Fla.
Mine at Ainslie, Ga.

Gilmer County
Willingham-Little Stone Co.,
301 Healey Bldg.
Atlanta, Ga.
S. J. Spiggle, Sec.
Mine at Whitestone, Ga.

Houston County
Georgia Lime Rock Co.,
P. O. Box 578
Ocala, Fla.
Mines at Clinchfield, Ga.
Perry, Ga.
L. O. Benton
Monticello, Ga.
Mine near Perry, Ga.

Pickens County
Georgia Mineral Products Co.,
Tate, Georgia

Central Commercial Co.,
322 S. Michigan Ave.,
Chicago, Ill.
Mine at Whitestone, Ga.

Polk County
Georgia Cement & Products Co.,
820 Forsyth Bldg.,
Atlanta, Ga.
Mine at Portland, Ga.

Southern States Portland Cement Co.,
Rockmart, Georgia

Whitefield County
Whitfield County, Highway Dept.,
Dalton, Georgia

MANGANESE**Manganiferous Iron Ore**

Bartow County
Harry B. Brown
Cartersville, Ga.

John Knight
Cartersville, Ga.

C. Culver
Cartersville, Ga.

H. L. Simpson &
H. E. Simpson
Cartersville, Ga.

Southern Mining Co., Inc.
P. O. Box 523
Cartersville, Ga.

J. L. Parker
Cartersville, Ga.

J. T. Thomason
Chattanooga, Tenn.
Mine at Cartersville, Ga.

Manganese Corp. of America
Bulliett Bldg.,
Philadelphia, Pa.
Now called:
White Manganese Corp.,
T. B. Holmes, Supt.,
White, Ga.

Homer H. Green
Cartersville, Ga.

J. R. Leachman
Cartersville, Ga.

Frank D. Smith
Cartersville, Ga.

J. L. Vaughn
R. F. D. 2
Cartersville, Ga.

Polk County
Ed Burks
Cedartown, Ga.
J. W. Houseal
Cedartown, Ga.

MARBLE

Cherokee County
The Georgia Marble Co.,
Tate, Georgia
Mine at Holly Springs, Ga.
(Serpentine or Verde Antique)

Pickens County
The Georgia Marble Co.,
Tate, Georgia

Randolph County
The Georgia Marble Co.,
Tate, Georgia
Mine at Cuthbert, Ga.
(Travertine)

MICA

Cherokee County
Thompson, Weinman & Co., Inc.,
Holland W. Smith
Cartersville, Ga.
Mine at Canton, Ga.
(Chlorite schist)

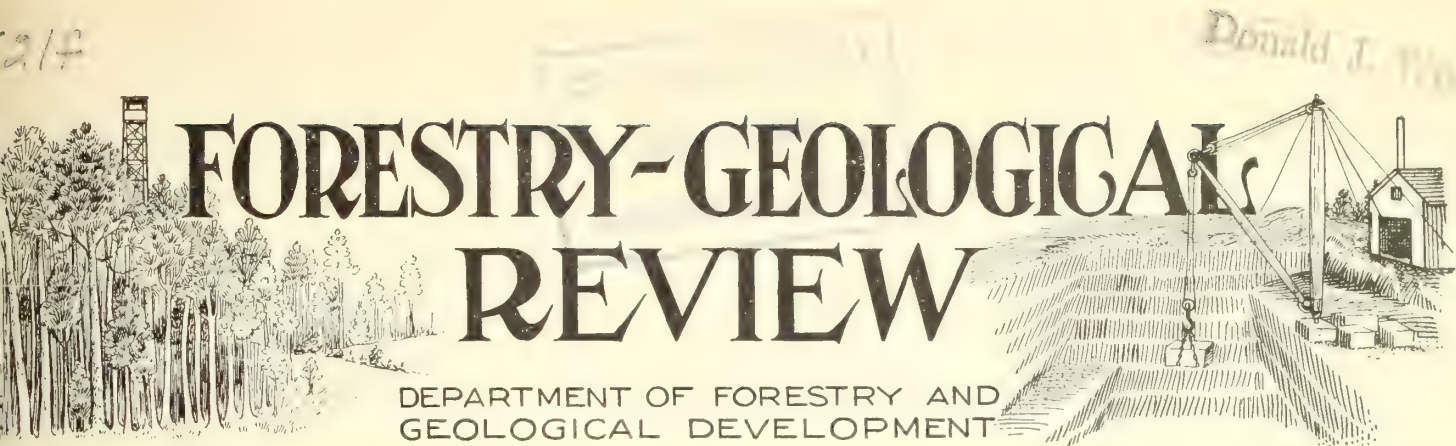
OCHER

Bartow County
New Riverside Ocher Co.,
J. R. Dellinger, Mgr.
Cartersville, Ga.

Cherokee Ocher Co.,
Cartersville, Ga.

SLATE

Bartow County
The Funkhouser Co.,
Hagerstown, Md.
Quarry at Fairmount, Ga.



ANNUAL COST OF FOREST FIRES SHOWS ALARMING SITUATION

**STATISTICS SHOW GREATEST NUMBER OF FIRES ARE MAN-
CAUSED—CAUTION IS THE ANSWER**

Forest fires in the United States during 1934 cost our country approximately one hundred and twenty-four dollars per day. This is an alarming statement to make, but nevertheless it is true. No country in the world can stand such a drain on its forests for any great length of time. Unless we steadily improve the method of handling our forests, there will come a time when we shall have no serviceable forests. There are thousands of acres in our state and privately owned forests on which conditions can greatly be improved and timber production increased.

If our state and nation are to maintain commercial prosperity, we must solve our forest problems. What does it mean to prosperity when such great manufacturing centers as Pennsylvania, New York, Michigan and Ohio have to import lumber in billions of feet every year to keep their factories going? New York alone imports approximately three billion feet annually, or 97 per cent of the amount used.

It is a true statement that FIRE is our forest's greatest enemy. Bells clang and sirens shriek as the fire fighting equipment sweeps through the streets. Something is burning! But the average city fire is almost nothing compared to the roaring sweep of flames through a forest dried out by a hot sun. More timber is destroyed annually by fire than is put to use.

In the year 1934, there were thousands of forest fires in the United States, burning over millions of acres of forest land. It would cost millions of dollars to reforest this burned-over land, and it would take many years to accomplish the task at the rate we are now going.

Not one person in a thousand gives thought to the increased call on our forests for wood to replace the millions of dollars annual loss from fire each year. The terrific drain on our forest products by fire losses must be cut down much closer to the point where lightning only can be blamed.

Since the establishment of the Georgia Forest Service, FOREST FIRE CONTROL has been one of its major activities. Great progress has been made in bringing forest areas into timber protective organizations. This has been attained by enlarging the holdings of old protective organizations and the formation of new ones. There are approximately twenty-three million acres of potential forest land in Georgia. Of this approximately five million acres or 25 per cent, are under organized protection.

In addition to the five million acres belonging to the timber protective organizations, approximately 550,000 acres are also under effective fire control. Included in this estimate are the national forests, national parks, national military reserves, state parks, game preserves, town forests and school forests.

Forest fires during 1935 in Georgia were less prevalent than during the two previous years. The public is gradually developing a sentiment against burning the woods, and fewer are purposely burning their woods.

During 1935 there were 14,943 forest fires in Georgia. The number of fires on protected forests was 2,401 as compared with 12,542 on unprotected areas. The total acreage burned over on the protected forests was 264,726 acres as compared with 2,423,630 acres on unprotected areas. The estimated damage done to protected forests was \$405,454, as compared with \$3,635,445 on unprotected areas. The above figures prove conclusively that protection to forests pays in dollars and cents.

Information released recently by the Georgia Forest Service shows that carelessness and debris burning, along with miscellaneous causes, are the greatest causes of forest fires. We are publishing the different causes of forest fires in Georgia during the past year, with the num-

(Continued on Page 2)

FORESTRY AND WATER POWER

**By W. H. Barnwell
Industrial Agent Georgia Power
Company, Atlanta, Ga.**

If we will draw on our imagination, it is not hard to visualize the State of Georgia several centuries back, as one vast forest from mountains to coast. The forests of that time were known as virgin forests, because the natural processes of reproduction and decay had continued uninterrupted throughout the previous centuries. The same rivers that now drain the State doubtless followed the same courses then as they do now, and the average annual rainfall has perhaps varied little during this long period of time.

Virgin forests as above described, have a controlling influence on the rapidity of run-off of rainfall after it reaches the forest floor and the loss of this controlling influence through loss of our virgin forests is the problem that is confronting us today.

In order that we might more clearly understand how the forests control the rapidity of run-off of rain water, a study of the construction and absorptive nature of the forest floor is necessary.

The forest floor is built up over a long period of time by the continual decay of trees, roots, leaves, twigs, grasses, and brush of all kinds. The trees, in growing, force their roots deep into the ground and these roots expand year by year until the tree reaches its full growth. The tree on dying, falls to the earth where its trunk decays on the surface, while the roots decay below the surface and form porous, spongy conduits that readily absorb water and carry it deep into the ground. The rotted roots below the surface, by completely honey-combing the sub-soil, create a ground storage capable of absorbing and storing the water as it seeps through the surface mulch. The trees, leaves, twigs, grasses and brush, decay on the surface each year and constantly add to the accumulation of previous years.

The forest floor of a virgin forest is the sponge provided by nature to control the rapidity of run-off of rain water; to

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Jack Thurmond, Asst. State Forester	Atlanta
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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

ANNUAL COST OF FOREST FIRES SHOWS ALARMING SITUATION

(Continued from Page 1)

ber of fires from each cause; also the number of acres burned by each cause and the damage in dollars and cents by each cause. These figures are for the protected area:

Cause of Fire	No. of Fires	Acreage Burned	Damage in Dollars and Cents
Lightning	7	27	\$ 38.
Railroads	55	2,518	3,575.
Campers	21	525	745.
Smokers	24	552	783.
Debris burners	98	13,710	19,468.
Incendiary	1211	153,145	218,465.
Lumbering	22	815	1,157.
Miscellaneous	938	109,670	155,875.
Unknown	31	3,764	5,348.
TOTAL	2401	284,726	\$405,454.

The above statistics show that approximately 95 per cent of the forest fires on protected areas in Georgia are man-caused. Such a high rate of human carelessness can only be reduced when the public begins to realize and appreciate forest values.

As the lakes, streams, parks and forests of Georgia continue to be the vacation centers for thousands of tourists, there is a greater need for public education on forest fire prevention and suppression.

The opportunities for recreation, sport and other outdoor activities, along with the commercial value of the forest, will no longer be available if fires are allowed to claim their heavy annual toll from the for-

ests of our state. To help check this yearly loss, a public appeal is made to every one to put into practice a few simple forest fire protection rules as suggested by the Georgia Forest Service. Everyone should be more careful with fire when in or near the woods.

FORESTRY AND WATER POWER

(Continued from Page 1)

store the water for plant growth, and maintain a reserve to carry through periods of drouth; and to enable the earth itself to act as a vast reservoir and filter.

If we destroy the forest floor, our land is subjected to devastating floods; our plant growth is retarded or eliminated through the erosion of the soil; there is no reserve water supply to carry through periods of drouth and the ocean too quickly becomes the reservoir of our rainfall while our land is practically reduced to a barren waste.

Destructive floods were unknown during the period when our virgin forests existed, because the virgin forests acted as vast reservoirs holding the rain water in suspense and permitting it to gradually permeate into the brooks and streams and reach the rivers over periods of time ranging from weeks to months. But today, with our forests considerably depleted, we are periodically subjected to destructive floods, whose waters are filled with silt and debris which is largely deposited in the delta sections of our rivers.

The extent to which we have already destroyed our forests over the past century is realized when we note that 13,859,000 acres—a little more than a third of the State's total area—is now cleared land. Most of this cleared land is used for agricultural purposes and most of it will remain cleared; but any further encroachment on our forested areas, especially in the mountainous section of the State, would be most unwise and quite unnecessary. In fact much of the land already cleared should be reforested, as a considerable portion of it is waste or marginal land and has no agricultural value.

To illustrate the way in which a good forest floor absorbs and controls the run-off of rainwater, let us consider the peaked roof of a house covered with sponges. Rain, on falling on this roof, would be absorbed by the sponges as fast as it fell, and, until the sponges were completely saturated, no water would reach the gutters. When the saturation point was finally reached, the water would then flow to the gutters and drain to the ground.

If, under the sponges instead of the roof, we had a typical forest floor you would find that the water, instead of flowing to the gutters when the sponges were saturated, would sink into the earth and be stored, and very little run-off would reach the gutters.

Now take this roof without the sponges

or the forest floor, and the same rain fall would flow rapidly to the gutters, probably overflowing them, and from the gutters to the ground and the roof would soon be dry.

Now let us transfer this experiment from the roof of this house to the drainage basin of the Chattahoochee River north of Norcross. The area of this drainage basin is 1,170 sq. miles. A rainfall of three (3) inches in twelve (12) hours is a matter of record in this basin. Such a rainfall on this area would deposit 8,154,432,000 cu. ft. of water. Under the deforested conditions that now exist in this drainage basin, this rainfall would cause the river to reach flood stage at Atlanta and perhaps maximum flood stage of the river were already swollen from previous rains, as is so often the case. The flow of this river under maximum flood conditions at Atlanta has been estimated at approximately 54,700 cu. ft. of water per second.

But suppose this drainage basin instead of being forested as at present were completely cleared of all forests. The water on reaching the ground would flow rapidly to the streams and rivers and it is estimated that at some period during the twelve (12) hour rainfall, approximately one half of this water, or 4,077,216,000 cu. ft. would pass Atlanta over perhaps a six hour period. Such a flow would indicate that 172,700 cu. ft. of water per second must pass Atlanta as compared to 54,700 cu. ft. per second, which is the river's present maximum.

The result of such a flow would be entirely disastrous. Railroad and highway bridges, power dams, and property far above the present flood contour of the river basin would be badly damaged or entirely destroyed. Much human life and live stock would be lost, hillsides would be cut away and bottom lands would be scour ed clean. The property loss would run into fabulous figures and probably no attempt would ever be made to utilize the power from the uncontrolled flow of this river.

It can, therefore, be seen that under such conditions, we would have lost our forests and would have lost the fertility of our land in this river basin through erosion of the soil and we would have lost control of our rainfall and all probability of ever utilizing its potential power. Of course, such a condition is an extreme and theoretical case, but it demonstrates the necessity of control of our rainfall through the only means possible—our forests.

Besides controlling the rapidity of run-off of rain water and storing a large proportion of it for day periods, our forests have further beneficial effects. It has been proven by experiment that heavily wooded forests absorb and evaporate approximately 40 per cent of all rainfall before it reaches the ground. Such evaporation provides the humidity in the atmosphere.

(Continued on next page)

(Continued from Page 2)

necessary to plant and animal life and in providing an equable instead of an arid climate. It is obvious from the above statement that without our forests to evaporate 40 per cent of all rainfall, the run-off of our drainage basins would be increased by this 40 per cent, which, in turn, would increase the flood proportions of streams and unforested lands by this amount. The evaporation capacity of our forests is an intangible factor overlooked by the layman, but a tremendous contributor in preventing the devastating floods that occur in cleared river basins.

Looking at Georgia's forests from a monetary point of view, statistics record that for the year 1930 the lumber from our forests was valued at approximately \$25,000,000, and our poles, crossties, turpentine, rosin, etc., at \$30,000,000.

In conclusion, I believe we will all agree that our forests and our rainfall are essential one to the other and to the support of all animal and vegetable life. The forests are the control provided by nature to retard the force of gravity in its ceaseless effort to drain all rainfall from the land and deliver it at sea level and every time we clear more and of its forest growth we assist gravity in its effort to deprive us too quickly of this essential to our very existence.

If we clear away all of our forests, we lose not only their value and their control of our water supply; but we also destroy the value of our land through erosion and lack of moisture and our water powers would be most difficult to develop economically because the streams would be entirely uncontrolled.

Already we have cleared our land of one third of its forests. How much further can we go? It would seem that we have reached the danger point and that reforestation should be next in order.

Along with reforestation should go fire prevention, since fire in a few hours time can destroy forest protection that has taken many years to develop. There is already a national awakening to the necessity of protecting our forests because they protect us, and we in Georgia should make a leading part in safe-guarding this asset of nature which has such a vital bearing on our physical, economic and social well being.

EXECUTIVE COMMITTEE GA. FORESTRY ASSN. MEETS IN COLUMBUS, MAR. 12

The Columbus Chamber of Commerce was host to the executive committee of the Georgia Forestry Association on Thursday, March 12, at the Ralston Hotel. This meeting was for the purpose of discussing important forestry matters and making plans for the annual meeting of the association. Mr. T. G. Woolford, president, presided.

Committee reports were read and discussed. The committee on water resources gave an interesting report on the water resources of Georgia and stressed the importance of a survey of the streams of our state being made for definite information as to stream flow and analysis of the most important streams. It was pointed out that this type of information is very important at this time, particularly since all kinds of industries must have this information before opening new plants. Much interest was shown in this discussion and the committee on water resources was instructed to work to the end that this important survey be started as quickly as possible.

Mr. C. G. Paulsen, Chief of the Surface Water Division, Water Research Branch U. S. Geological Survey, Washington, D. C.; D. S. Wallace, Engineer in Charge of the Florida District; C. E. McCashin, Engineer in Charge of the Tennessee District; and J. H. Barber, Engineer in Charge of the Alabama District attended the meeting and gave valuable information on the method of conducting such a survey and the extent that the U. S. Geological Survey could and would cooperate.

Richard W. Smith, State Geologist, attended the meeting. He also stressed the importance of such a survey and expressed his willingness to cooperate in any way in making such a survey possible.

Definite plans were worked out for holding the fifteenth annual meeting of the association. This meeting will be held in Columbus May 7 and 8. The program for the meeting will be announced at a later date.

The Georgia Forestry Association, composed of citizens of our state interested in forestry, is doing a great deal to create public interest in forestry and has very enthusiastically sponsored every important forestry activity in the state.

Those who are interested in developing the forest resources of the state should plan now to attend the meeting in Columbus.

NEW INDUSTRY CREATED BY USE OF PINE NEEDLES

An entirely new product, known as pine felt, is being made by a company in Hattiesburg, Mississippi. This pine felt is to be used for upholstering, for mattress filling, and similar purposes.

Pine needles brought to the plant by farmers who collect them bring an average of \$4.00 per ton, and it takes 2 tons of pine needles to make one ton of fibre.

The needles are placed in a retort and chemically treated, then run through a series of carding machines which tear them into fine shreds. After being thoroughly washed, dried and baled, they are ready for market.

The patented pine felt process and machinery were invented by a Hattiesburg man, Mr. A. T. Ratliff. The corporation is known as the Pine Felt Corporation and the officers are R. R. Guice, president, and W. J. Morris, secretary.

ATLANTA'S DOGWOOD FESTIVAL

Heeding the oft-repeated plea of artists and other lovers of nature that her annual dogwood display is one of the world's most beautiful sights, Atlanta is this year celebrating the first annual Dogwood Festival. In preparation for future displays, 50,000 young dogwood trees have been planted throughout the city and along the approaching roads, and against the background formed by the existing trees, and the trees to be, the city plans to celebrate the dogwood season each year.

The week of April 19-25 is to be devoted to a program which ranges from Metropolitan Opera stars and the Philadelphia Symphony to golf, tennis, baseball and other sports, with a wide variety of entertainment for visitors and citizens between. The keynote of the whole festival, however, rests upon the fact that Atlanta has a great natural feature, and is letting the world know about it, and inviting the world to help her enjoy it.

DOGWOOD

Within the drab and leafless wood,
There grows a wondrous little tree;
The glory of the forest mood
In modest self-sufficiency.

When violets peep out in the Spring,
And redbirds voice their note of love;
When Indianpipes their welcomes bring,
And monkey-cups give mold a shove.

The fairy of the forest comes
With paint-brush beam of silver flax;
The first spring flow of sap becomes
Ruffed moonlight, crystallized in wax.

A silver sheen, a glorious view,
In early spring is dogwood bloom;
Like a bouquet with pendant dew
That freshens all the forest gloom.

Snowy crown of beauty shows,
Dimpled fair with scalloped grace;
Sometimes a little blush of rose
At naked limbs around—disgrace.

In summer berries green 'mid leaves
Attract the birds and squirrels, too;
In autumn gorgeous tinted sheaves
And coral berries ripe with dew.

Thomas E. Davenport.
Magnolia Cottage, Shellman, Ga.

PRACTICES IN FORESTRY THAT HAVE TAUGHT ME VALUABLE LESSONS

By JOHN BEGGS, Hartwell, Ga.
Student of Hartwell High School
Wins Third GFA Prize

During my five years of study in vocational agriculture, nothing has been more interesting or so valuable as forestry.

The most interesting thing that I learned was in regard to growing pine seedlings. First, through field practice, I learned to select seed by collecting pine cones in October. I discovered that it was a simple matter to separate the seed from the cones. After saving the seed, I learned the importance of preserving them until planting time. In the cold frame which we built at the school, I gained practice in the preparation of soil, planting of seed and the growing of seedlings.

By planting seedlings on our F. F. A. forestry plot, I gained valuable experience and also learned more of the art by helping to plant several thousand additional pine seedlings.

In the forestry plot I saw the effect of burning over timberland on the growth of the trees. For, by measuring the trees D. B. H., I noted that the trees on the adjoining plot which was not burned over made a greater annual growth.

My practice of selective thinning taught me a valuable lesson, for, already during a five-year period, I have noticed that the trees on the forestry plot in which selective thinning was practiced have made more growth and are more desirable in type than trees nearby which were not thinned.

For the past three years I have helped

to prune pine trees on the forestry plot. I cannot yet see the full value from this work, but the pruned trees already appear to be more nearly the type from which to grow timber than those trees which have not been pruned. Then too, I have faith in the practice since a representative of our State Department of Forestry said that the production of timber may be increased as much as thirty per cent as a result of pruning.

Each year I have had experience in constructing a firebreak around our forestry plot. The lesson gained in the method of making a firebreak was interesting, but my greatest benefit from this experience was a realization of the importance of preventing forest fires.

I have had one opportunity of establishing an emergency firebreak. This was when members of our F. F. A. were called to stop a fire which was making much progress in burning over a ten-acre tract of forest. By hastily raking away leaves in the path of the fire, we were able to prevent the fire from damaging more than one acre of trees.

But the most important lesson that I have learned was the result of field practice. This was in connection with the planting of two thousand pine seedlings on an eroded hillside. The actual planting of those trees caused me to have a clearer understanding of the importance of planting trees on our marginal land. Then, too, I realize that this practice is an important part of our soil conservation program.

ALBANY CHAMBER OF COMMERCE ENTERTAIN TEACHERS AND STUDENTS

Teachers of vocational agriculture in District Eight in southwest Georgia, together with a number of forestry students from each vocational school, were invited to spend the day at Albany, on March 26, as guests of the Albany Chamber of Commerce. The Chamber of Commerce provided some entertainment for their guests, which included luncheon, but the main object was that the teachers and forestry students might study the technique of nursery operations.

The Georgia Forest Service, through H. D. Story, Jr., district forester, is enlarging the nursery at Albany this year, and it was Mr. Story's plan to have teachers and students observe at first hand the preparation of seed beds and the planting of pine seed. The sprinkler system was fully explained to them, together with the correct transplanting of seedlings, and it is believed that both teachers and students not only had a most enjoyable day, but will be materially benefited by the first hand information obtained. Mr. M. E. Murphy is nurseryman, in charge of planting.

The splendid cooperation of the Albany Chamber of Commerce in all the work that has been carried on by the Georgia Forest Service in that section of the state is acknowledged with sincere appreciation and the work of District Forester Story has been advanced considerably by the assistance that the Chamber of Commerce has rendered.

GOOD TIMBER

The tree that never had to fight
For sun and sky and air and light,
That stood out in open plain
And always got its share of rain,
Never became a forest king
But lived and died a scrubby thing.
The man who never had to toil,
Who never had to win his share,
Of sun and sky and light and air,
Never became a manly man,
But lived and died as he began.
Good timber does not grow in ease;
The stronger wind, the tougher trees,
The farther sky, the greater length,
The more the storm the more the strength
By sun and cold, by rain and snows,
In tree or man good timber grows.
Where thickest stands the forest growth
We find the patriarch of both,
And they hold converse with the stars
Whose broken branches show the scars
Of many winds and much of strife—
This is the common law of life.

—Douglas Malloch.



VOCATIONAL FORESTRY CLASS, CARNESVILLE HIGH SCHOOL

HISTORIC TREES OF GEORGIA

Since the mind of man runneth not to the contrary, trees have been famous in song and story, in paintings and other works of art. The familiarity of wood in our daily lives would seem to lessen any esteem in which a mere tree might be held. Notwithstanding the millions of trees growing on the hillsides of our country and our own state, and the many millions more planted in the gigantic reforestation program throughout our nation, there are still a few trees that have been made famous by writers, or by circumstances surrounding a particular tree, which has caused it to be preserved as a monument to some specific sentiment.

Georgia has a group of historic trees which deserve mention.

LANIER OAK, Brunswick.—A live oak under which Sidney Lanier, the poet, is supposed to have written his poem, "The Marshes of Glynn".

WESLEY OAK, on St. Simons Island, near Brunswick.—An historical oak under which John Wesley is reputed to have delivered his first sermon to the colonists and Indians after he landed with General Oglethorpe.

FRANKLIN DELANO ROOSEVELT OAK, Warm Springs.—A large and beautiful oak was deeded to Franklin D. Roosevelt—then president-elect—at a forestry meeting at Warm Springs, November 29, 1932. Mr. Roosevelt expressed his appreciation of being the owner of such a magnificent tree.

The original **TREE THAT OWNS ITSELF** is located at Athens. This tree was deeded to itself and a certain area surrounding it set aside to aid in its care and preservation.

The **OXFORD OAK, Oxford, Ga.**, is a large, symmetrical white oak tree that was deeded to itself. This is sometimes called the Yarbrough Oak, because it was cared for by Rev. John W. Yarbrough, who called it the "Prince of the Forest". At his death the Woman's Club purchased the ground on which the tree stood and issued a deed to the tree, as owning itself.

A tree that is known as the **LARGEST LIVE OAK** in the state is at Thomasville. This tree is more than 200 years old.

THE ABRAHAM LINCOLN OAK, near Albany, is so named because the profile is similar to that of President Lincoln.

There are a number of other trees in Georgia that deserve mention. Among them are some that have long since fallen, either from decay or to make room for improvements, but a few of them should be mentioned. At Indian Springs, it was the custom for the Creek Indians to hold councils and feasts under what was known to them as **THE BIG TREE**, and it is said that under this tree Chief McIntosh signed the treaty that ceded certain lands to Georgia to be forever preserved for the

use of those seeking health from the nearby spring. This was afterwards known as the McIntosh Oak.

Another is located at Jefferson, Georgia, and is a tree under which Dr. Crawford W. Long used to sit and work out formulas, finally evolving the one for the alleviation of pain.

At Floyd Springs, near Rome, stood a tree under which Alexander H. Stephens, vice president of the Confederacy, made his famous speech in 1860.

On the campus of the University of Georgia, at Athens, was a tree which has since been removed, that was called the **TOOMBS OAK**, famed for the scene of a fiery speech made by Robert W. Toombs, when he had been dismissed from the university. This drew most of the students from the chapel where lectures were in progress, leaving only a handful of students to hear the speakers inside the chapel.

On St. Simons Island grew a tree from which the keel of the famous battleship **OLD IRONSIDES** was made.

In recent years a number of trees have been planted on the grounds of the state capitol, honoring prominent citizens, and this publication recently called attention to the fact that the City of Savannah has a planting project extending over a considerable portion of that city honoring Dr. Chas. H. Herty.

PINE SEED FOR SALE

While the Georgia Forest Service does not conduct a market for the sale of tree seed, a good many vocational students and some teachers in the state collect more pine seed than they can use in their school forest and in their immediate community, and the Georgia Forest Service frequently has inquiries as to supplies of seed, and in this way endeavors to bring the buyer and seller of pine seed together.

LONGLEAF PINE SEED may be secured from the following parties:

Roy Ellington, Summit, Ga.

Clovis Turk, Sale City, Ga.

R. E. Hughes, Millen, Ga.

SLASH PINE SEED may be secured from:

O. O. McIntosh, Leslie, Ga.

T. G. Walters, Moultrie, Ga.

R. E. Hughes, Millen, Ga.

R. W. Clark, Garfield, Ga.

LOBLOLLY PINE SEED may be secured from:

J. K. Callahan, Wrens, Ga.

R. E. Hughes, Millen, Ga.

The prices quoted for Longleaf are 50c and 75c per pound; for Slash 75c and \$1.00 per pound; and for Loblolly 75c.

We also have information that D. E. and J. O. Kelley, of Jeff, Alabama, have 15 bushels of black walnuts that they would like to dispose of at 2 1-2 cents per pound.

Anyone desiring the above seed, please write direct to the party having seed on hand.

SHOULD SMALL TREES BE TURPENTINED?

In answer to the above question, *Southern Pine Forestry Notes No. 10* of the Southern Pine Association for 1936, is quoted:

"Studies in naval stores indicate frequent turpentineing of longleaf and slash pine trees having a diameter less than that which may profitably be worked. While it is likely that the optimum minimum tree diameter for naval stores will vary locally, it should be pointed out that working trees under a 9-inch diameter limit will generally be unprofitable. In this connection, it should be pointed out that only about 8 years are required for trees to increase 2 inches in diameter. Experiments conducted by the U. S. Forest Service show that gum yield is closely related to the size of the tree and that yields mount rapidly with larger diameters. For example, trees 11 inches in diameter at breast height produce approximately twice as much gum as 7-inch trees. In fact, a minimum diameter of 11 inches has much in its favor, but because of pressure of economic factors, might be difficult to effect unless it is approached gradually. Not only will this higher minimum limit increase current yields, but it also makes more readily attainable three successive faces, if desired. Also, since facing a tree considerably lessens its ability to increase in volume, a larger tree will result in a much shorter time.

"The following table presents naval stores yields that may reasonably be expected from trees of given diameters.

YIELDS OF NAVAL STORES FOR I YEAR BASED ON DIAMETER OF TREE

Diameter at breast height Inches	Face width (One face) Inches	Naval-stores yields *Units per crop
7	7	26
9	9	39
11	11	51
13	12	66
15	12	75

* 3-1/3 barrels of rosin and 1 barrel of turpentine."

SECOND CONVICTION FOR FIRING WOODS

For the second time in the history of Chatham county, there has been a man tried, convicted and sentenced for setting fire to the woods.

It is indeed gratifying to the Georgia Forest Service and other "forest-minded" citizens of the state that the courts are taking cognizance of the value of fire protection and are lending their aid in this great cause by sentencing violators of state fire laws.

FIRST DISTRICT

**T. P. Hursey, Dist. Forester,
ROME**

The Chattooga county TPO is doing nicely at the present time, and for the time being looks promising. Within thirty days time they have a total acreage of 6,590 acres signed.

The Cherokee County TPO is busy now putting up a telephone line through their main body of property. The line will be between 13 and 15 miles long, connecting all patrolmen. The line is being constructed by the TPO members and the equipment other than wire and insulators is being bought by the TPO.

Prospects for a Whitfield County TPO are brighter.

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

Vocational Teachers Initiate Planting Program

The program of planting seedlings in the community around each school, as initiated last month, has met with enthusiastic support by teachers throughout the Gainesville District.

The following teachers, in addition to those reported last month, have expressed a willingness to carry out the program.

G. L. Blackwell, Winder—5,000 seedlings.

S. R. Story, Dawsonville—5,000 seedlings.

E. H. Thomas, Nancy Hart—5,000 seedlings.

C. M. Reed, Sardis Consol.—5,000 seedlings.

Pete Herndon, Shoal Creek—5,000 seedlings.

V. P. Corbett, Air Line Consol.—5,000 seedlings.

F. M. Young, Centerville—5,000 seedlings.

A. C. Ellington, Fortsonia—5,000 seedlings.

R. L. O'Kelly, Goldmine—5,000 seedlings.

R. L. O'Kelly, Eagle Grove—5,000 seedlings.

Additional names will be sent in next month.

Each year the world cuts about fifty-six billion cubic feet of wood. Of this a little less than half is of a size and quality that makes it suitable for sawn lumber. The average citizen of the world uses about thirty-two cubic feet of wood a year.

SIXTH DISTRICT

**W. G. Wallace, Dist. Forester,
Savannah**

Extensive Carpet Grass Plantings by the CCC

Although the original quantity of carpet grass seed contemplated has not been planted, the CCC in the Savannah District has planted extensive mileage of ECW and TPO firebreaks with carpet grass seed supplied by the TPO members. These plantings were made primarily as practical demonstrations in determining the value of carpet grass on firebreaks for elimination of maintenance as well as for grazing purposes.

Indications, in view of similar plantings, made a year or so ago, are that such plantings will be very practical when made on firebreaks not located on too well-drained land.

Approximately ten to twelve pounds carpet grass seed per acre has been planted, as a rule, with three men planting about five miles of firebreaks per day. The entire cost is very reasonable, and it is to be expected that the practice of planting carpet grass on suitable firebreaks will increase greatly next year.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

Mr. H. N. Wheeler, Chief Lecturer, U. S. Forest Service, spent the week from March 2 to March 8 in this District giving lectures to the seven CCC Camps the TPO members and anyone wishing to attend. Slides were shown in connection with the lectures and everyone attending expressed their appreciation to Mr. Wheeler and requested his return.

ECW Notes

Five new steel towers are in the process of construction in this District, making the tower and telephone system for the District much more effective.

P-68, Douglass, is constructing a side camp at Fitzgerald to be occupied by 50 negro junior enrollees. The Fitzgerald area is a part of the Coffee-Jeff Davis TPO at the present time and covers approximately 50,000 acres in Ben Hill and Irwin Counties.

TPO Notes

Construction of the TPO dispatching center and dwelling house for the Consolidated TPO is nearing completion. The buildings are log structures with the logs

perpendicular to the ground and a cement mixture used for clinking.

The Appling, Wayne and Brunswick-Peninsula TPO's are planning to construct TPO headquarters in the near future with the assistance of the camps in those areas.

The Brunswick-Peninsula TPO is contemplating the purchase of a tractor and plow and a concentrated drive is being made by the members to increase the TPO acreage. R. P. Marsh, Secretary of the Brunswick-Peninsula TPO handed in his resignation effective March 15. Mr. Marsh has accepted a position with the Resettlement Administration at Cornelia.

Fires in this District have been less this season in this District than in many years and it is hoped that the sentiment toward burning is changing and that the reduction in number and size of fires is not entirely due to the weather condition.

INCREASE IN TPO ACREAGE

The Sixth Forestry District, headquarters at Savannah, shows an increase in TPO acreage in the past sixty days of 80,88 acres. These figures bring the total in this district to 897,596 acres under organized fire protection.

The actual protection would exceed this figure because of the fact that adjoining lands, although not listed in the organizations, are less liable to damage from fire because of protective measures on surrounding lands.

The benefits accruing to owners of forest lands are so many that it seems a owners of such lands would be glad to join an organization for the protection of such valuable property.

Acreage in other districts has no doubt been signed up, but reports did not reach the editor's desk in time to be incorporated in this report.

A "Creed for Sportsmen", adapted by former ranger in Yosemite National Park from a "Creed for Fishermen":

**CREED
for**

**SPORTSMEN
MANLY MEN**

MEN OF GENTLE MIND AND GENTLE HEART

**BRAVE MEN — FAIR MEN
MEN WHO SAY TO THE WEAK
"MAY I"**

and

TO THE STRONG "I WILL"

Men to whom sham is dishonor

Truth a guiding Star

Men who look upon the sea, the plain,

**The forest, the mountains, the rising
And setting sun and the immutable**

**Heavens with a deep sense of their
Own littleness in the great scheme
of things.**

**From PARK SERVICE BULLETIN,
U. S. D. I., Washington.**

**GEORGIA MINERAL DIRECTORY
1935**

(Continued from March Review)

SAND AND GRAVEL

- Crawford County
Atlanta Sand & Supply Co.,
602 Forsyth Bldg.,
Atlanta, Ga.
Mine at Gaillard, Ga.
- Dougherty County
Dawes Constr. Supply Co.,
Thomasville, Ga.
Mine at Albany, Ga.
- Echols County
Dawes Constr. Supply Co.,
Thomasville, Ga.
Mine at Mayday, Ga.
- Hall County
F. R. Switzer
Gainesville, Ga.
(Gravel and gold placer)
- Muscogee County
Georgia Gravel Co.,
Columbus, Ga.

Wardlaw Sand & Gravel Co.,
Columbus, Ga.
- Talbot County
Brown Bros. Corp.,
Howard, Georgia
Mine at Junction City, Ga.

Junction City Sand Co.,
Att: C. W. Moore,
Junction City, Ga.
- Taylor County
Brown Bros., Inc.,
Howard, Ga.
- Thomas County
Dawes Construction Supply Co.,
Thomasville, Ga.

TALC AND SOAPSTONE

- Murray County
Cohutta Talc Co.,
H. M. Broyles
Dalton, Ga.
Mine at Chatsworth, Ga.

Georgia Talc Co.,
J. Frazier Glenn,
Asheville, N. C.
Mine at Chatsworth, Ga.

Southern Talc Co.,
Wm. B. Hartsfield, Pres.,
808 Grant Bldg.,
Atlanta, Ga.
Mine at Chatsworth, Ga.

TRIPOLI

- Chattooga County
Tennessee Valley Mineral Co.,
Wm. J. Seas, Sales Mgr.,
R. F. D. No. 3
Summerville, Ga.
Mine at Harrisburg Station, Ga.

**CERAMIC PLANTS IN GEORGIA
BRICK**

- Baldwin County
Milledgeville Brick Works,
Milledgeville, Georgia
- Bibb County
Cherokee Clay Products Co.,
Macon, Georgia
Bibb Brick Co., Macon, Ga.
- Clay County
Fort Gaines Brick Co.,
Fort Gaines, Georgia
- Cobb County
G. W. McMillan Co.,
Acworth, Georgia
- Floyd County
Romega Brick Plant, now owned
by the Berry Schools,
Mount Berry, Georgia
- Fulton County
Chattahoochee Brick Company,
Atlanta, Georgia
- Gordon County
B. Mifflin Hood, Calhoun, Ga.
(headquarters at Daisy, Tenn.)
Plainville Brick Co., Inc.,
Plainville, Georgia
- Greene County
Ogeechee Brick Co.,
Union Point, Ga.
- Hall County
Hudson Brick Company,
Gainesville, Georgia
- Polk County
Monarch Brick Co.,
Cedartown, Ga.
- Richmond County
Georgia Vitrified Brick Co.,
Campania, Ga., (headquarters
at Augusta, Ga.)

Georgia-Carolina Brick Co.,
3 plants, Augusta, Ga.
- Merry Bros. Brick and Tile Co.
Augusta, Georgia

Thomas County
Arnold Brick Yard,
Thomasville, Ga.

Whitfield County
Dalton Brick & Tile Co.,
Dalton, Georgia

BUILDING TILE

- Baldwin County
Oconee Clay and Shale Products Co.,
Milledgeville, Ga.
- Bibb County
Cherokee Clay Products Co.,
Macon, Ga.

Bibb Brick Co.,
Macon, Ga.
- Richmond County
Merry Bros. Brick and Tile Co.,
Augusta, Ga.

CEMENT

- Houston County
Pennsylvania-Dixie Cement Corp.,
Clinchfield, Georgia

- Polk County
Ga. Cement & Products Co.,
Portland, Georgia

Southern States Portland Cement Co.,
Rockmart, Georgia

FIRE BRICK & REFRACTORIES

- Baldwin County
General Refractories Co.,
Stevens Pottery, Ga.
- Hancock County
Atlantic Refractories Co.,
Carrs Station, Ga.
- Richmond County
Babcock & Wilcox Co.,
Augusta, Ga.

POTTERS

- Bartow County
Mr. William J. Gordy,
The Georgia Art Pottery,
Cartersville, Georgia
- Bibb County
Mr. Emmett Merritt
Middle Georgia Pottery,
Lizella, Ga.
- Cobb County
Mrs. J. P. Reid,
Acworth, Ga.

Mr. L. H. Franklin,
The Franklin Pottery,
Marietta, Ga.
- Fulton County
Mr. U. A. Brown,
The Brown Pottery,
Moores Mill Road,
Route 7, Atlanta, Ga.

Mr. E. J. Brown,
Bolton, Ga.
- Glenn County
Mr. A. V. Lawton,
The Englecraft Pottery,
Brunswick, Ga.
- Hall County
Mr. Roy Holcomb,
Gillsville, Ga.

Mr. John Hewell,
Gillsville, Ga.
(address correspondence
to W. P. Ferguson, Potter)
- Mr. C. R. Colbert Pottery,
Gillsville, Ga.
Mr. Merlin Hewell,
Gillsville, Ga.
- Meriwether County
Mr. W. T. B. Gordy,
The Gordy Pottery,
Greenville, Ga., Route 3
- Peach County
Mr. J. N. Long,
The Long Art Pottery,
Byron, Ga.
- Pike County
Mr. C. G. Bishop,
The Bishop Pottery,
Route 1, Meansville, Ga.

(Continued on next page)

CERAMIC PLANT DIRECTORY

(Continued)

Mr. S. R. Rogers,
The Rogers Pottery,
Route 1, Meansville, Ga.

White County

Messrs. L. Q. & Cheaver Meaders,
Route 2, Cleveland, Ga.

Messrs. F. B. & L. G. Meaders,
The Cleveland Pottery,
Cleveland, Ga.

ROOFING TILE**Bartow County**

B. Mifflin Hood Co.,
Adairsville, Ga.

Gordon County

B. Mifflin Hood Co.,
Calhoun, Georgia

SEWER PIPE**Bibb County**

W. S. Dickey Sewer Pipe Co.,
Macon, Georgia

Walker County

W. S. Dickey Sewer Pipe Co.,
Flintstone, Georgia

WHITE WALL TILE**Bibb County**

Carling Tile Co.,
Macon, Georgia

THE END

U. S. GEOGRAPHIC BOARD MAKES TWO DECISIONS AFFECTING GEORGIA

The U. S. Board of Geographical Names, according to State Geologist Richard W. Smith, has rendered a decision as to the spelling of two place names in Georgia.

Fairmount, a town in the southeastern corner of Gordon County, Georgia, on the Louisville and Nashville railroad shall be spelled as one word, not "Fair Mount."

Sister Island (not "Sisters" nor "The Sisters") shall be the official spelling of the name of an island about 650 yards long in the Wilmington River, southeast of Savannah, Chatham County, Georgia.

The U. S. Board of Geographical Names, according to Mr. Smith, is the Government agency that decides on the acceptability and official spelling of all place names of natural features such as mountains, lakes, and streams in the United States and its possessions. Mr. Smith asks that any Georgians knowing of places or natural features in the State that are known by more than one name or by a name spelled in different ways, communicate with him. They should give all the names or spellings used and state which they think should be the preferred name or spelling. These will then be investigated and reported for decision to the Board of Geographical Names.

U. S. GEOLOGICAL SURVEY PUBLICATION OF INTEREST TO MINERAL PRODUCERS

Bulletin 869. Bibliography of North American geology, 1933 and 1934, by E. M. Thom, 389 pages. This lists all publications on the geology of North America, including seven on Georgia. Order from Superintendent of Documents, Washington, D. C. Price, 40 cents in coin or money order; stamps not accepted.

GEORGIA APPALACHIAN TRAIL CLUB WORKS ON TRAIL

The Georgia Appalachian Trail Club has, for the month of March, split up into sections, each of which is responsible for clearing and marking about eight miles of the Appalachian Trail in Georgia. Fallen trees and brush will be cleared from the trail, signs and shelter cabins repaired, and additional trail markers put up where necessary to guide hikers. Mr. Carter Whittaker, President of the Georgia club, reports that indications are that there will be an increasing number of hikers this spring on the trail, which is a footpath through the wilderness of the mountains from Maine to Georgia.

FROM A GEOLOGIST'S NOTE- BOOK

The Georgia Mineral Society has been very active during the early part of this year. The Society, meeting on the first Monday of each month at the Atlanta Central Y. M. C. A., at 8:00 P. M., has grown to a membership of 45. Speakers at the meetings have included the members of the State Geological Survey speaking on the "Geology of the Warm Springs, Georgia, Area," Lester B. Forbes speaking on "Asbestos," and Alfred C. Hawkins speaking on "Mineral Collecting." All of these speakers have brought interesting facts before the Society. Field trips have been taken to the Warm Springs area and to Stone Mountain. The latter trip was made at night and a search for fluorescent hyalite was made with ultra-violet light, using radio "B" batteries and argon bulbs. Many beautiful specimens were found and several minerals not hitherto known at Stone Mountain were found. A report of their identification will be made later. The program for the April 6th meeting has not yet been announced but a field trip to a number of mineral localities in Cherokee and Pickens Counties has already been planned for sometime in April. The trip will include visits to mica, kaolin, serpentine, Canton schist, chlorite schist, gold, and marble deposits. President John L. Daniel, of the Society, has invited all interested persons to attend the field trip or any meetings. A card to the secretary, Lane Mitchell, 425 State Capitol, Atlanta, will place anyone's name on the mailing

list to receive notices of meeting or field trips.

A major project of the Georgia Mineral Society for 1936 has been the sponsoring of the formation of a number of junior mineral societies, designed to interest Georgia's youth in geology and mineral collecting. Plans are now being perfected for the formation of two such clubs in Atlanta schools. This is expected to be but a starter, as many other schools and young people's organizations have shown great interest in the subject. Paul Wei is chairman of the committee making these plans and serving with him are John I. Daniel, Lane Mitchell, of the Society, Mr. Charmian Howell, Mrs. Mattie Sue Walker, and Eugene Sanders, of the Atlanta Public Schools, and Miss Edna Lee, Children's Page Editor of the Atlanta Journal. Other schools, scout troops, or organized groups wishing to form a club or group for the study and collecting of minerals and rocks are urged to get in touch with the secretary of the Society, 425 State Capitol, Atlanta.

The display of fluorescent minerals in the State Museum in Atlanta has been attracting hundreds of visitors to the Capitol. So interested have many persons been in this property of fluorescence that the State Geologists have been repeatedly asked for explanatory literature. He wishes to call to the attention of those interested an excellent pamphlet on the subject: "The Fluorescence of Minerals," by Chester Slawson, procurable from The Cranbrook Institute of Science, Bloomfield Hills, Michigan, for 35c. The Mineralogist, 40 Couch Building, Portland, Oregon, is a monthly magazine containing numerous articles on the subject. The subscription price is \$1.00. A reprint of an article by Richard L. Barrett, "A Comparison of Ultra Violet Sources for Producing Fluorescence in Minerals," may be had free of charge by writing to the General Electric Vapor Lamp Company, Hoboken, N. J.

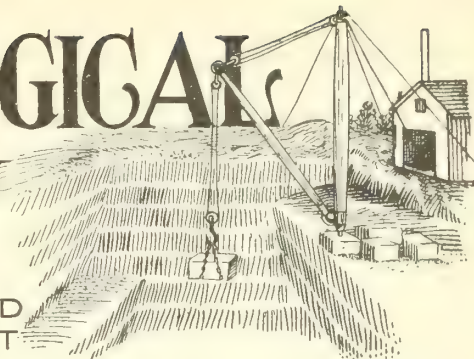
William B. Pitts, noted gem stone collector, has sent additional stones to be placed in the exhibit of his work on display at the Capitol. The new pieces include agate, ruby, milky quartz, and rutelated quartz from Georgia.

Lane Mitchell, Assistant State Geologist, was to attend the annual meeting of the American Ceramic Society in Columbus, Ohio, March 28 to April 4. He plans to urge the use of Georgia raw materials in ceramic ware and to aid in extending Atlanta's invitation to the Ceramic Society for a future convention in Georgia capital.



FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



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No. 5

THE EFFECT OF REFORESTATION ON SURFACE DRAINAGE AND PERMANENT UNDERGROUND WATER SUPPLY

The amount of water flowing over the earth's crust or surface is the governing factor that determines the extent of soil erosion. Erosion may be conveniently regarded as of two kinds. One kind occurs along streams as a result of either normal flood flow and may be called stream erosion; the other kind occurs over all other parts of drainage basins and may be called general surface drainage.

General surface drainage in carrying billions of tons of soil each year to the sea removes 21 times as much plant food from the soil as do cultivated crops. Surface drainage in Georgia has caused 59 per cent of our rich fertile lands to get away from us.

Many methods have been suggested and tried by which this surface drainage may be controlled. Of all methods that have been tried, it has been definitely proven that the surface drainage in forested areas is at a minimum, and that reforestation is the only permanent way of controlling surface drainage. The force of the blow struck by the raindrops is lessened by the forest cover, and very many of the drops do not strike the ground at all.

As the fallen drops gather to flow down the slopes, they are checked in their movement by the leaves and litter, so that much of the rainfall flows gently and slowly beneath the actual surface. The movement is so slow that scarcely any soil is removed, and for hours after a rain has passed the soil covering is filled with water, and even days later is still moist.

Of all the direct influences of the forest, the influence upon the surface run-off or drainage and underground water supply is the most important in human economy. We shall attempt to bring together impartially a few well established facts that the forests do have a direct influence on the amount of surface drainage, as well as the underground supply.

There are two methods of determining the

influence of the forest on the amount of water run-off and stream flow: (1) By actual measurements, continued for sufficient time of the total discharge and of the high and low stages of rivers having drainage areas essentially similar in regard to precipitation and geologic formation and topography; (2) By keeping records on areas having a varying kind and amount of litter or cover. The second method — since all states do not have a systematic method in use in gauging streams — is the most practical and universally used.

In studying the records available dealing with the surface drainage, it is necessary to take into consideration the character of the cover on the water shed, as this factor greatly affects the volume and velocity of the run-off and the soil load acquired by water before it reaches its final destination.

According to records that have been compiled by the U. S. Forest Service on the continuous flow of streams from 23 small watersheds, representing different types of forests and other vegetative cover conditions, for periods of from one to 2 1-2 years, we find that for the twelve month period July 1, 1934 to June 30, 1935, the average maximum flood flow for all forested watersheds amounted to only 38 cubic feet per second per square mile; for grassed and abandoned agricultural land, 432 c. f. s. per square mile; and for completely denuded land, 1304 c. f. s. per square mile. In no case did the water run-off from forested watersheds assume critical flood conditions, whereas, from the non-forested watersheds, numerous instances were recorded in which the maximum flow assumed very serious flood proportions.

Another interesting study that has been made by the Southern Forestry Experiment Station, New Orleans, La., of the surface run-off from comparable soils representing

(Continued on Page 2)

GEORGIA FORESTRY ASSOCIATION TO HOLD ANNUAL MEETING AT COLUMBUS MAY 7 AND 8

The fifteenth annual meeting of the Georgia Forestry Association will be held in Columbus, Ga., on May 7 and 8. Many prominent speakers will appear on the program and many forestry minded people will attend the meeting. Make your plans now to attend, for you will meet many people who are giving thought to forestry problems from a practical and technical viewpoint.

The tentative program is given in order that the readers of the REVIEW may get an idea of what topics will be discussed during the meeting. This program may be changed in one or two instances, but as a whole, it is the program that will be followed.

A trip to the Fort Benning reservation has been arranged for the afternoon of May 8. A CCC camp is located on this reservation and much forestry work has been done, such as firebreak construction, thinning, truck trail construction and other improvements. This trip alone is worth your attending the convention.

The program follows:

Fifteenth Annual Convention Georgia Forestry Association

May 7th-8th, 1936

(Thursday and Friday)

Sessions at Civic Building.

Headquarters, Ralston Hotel, Columbus, Ga.

Local Committee on Arrangements, Mr. W. J. Fielder, Chairman, Mr. L. W. McPherson, Mr. J. Homer Dimon, Mrs. C. F. Williams, Capt. James P. Wharton.

Morning Session

May 7th—9:30 A. M. (Central Time)

President, T. G. Woolford, Presiding
Invocation—Rev. Harry G. Walker, Rector, Trinity Episcopal Church.

Welcome Address—Mr. K. S. Worthy, President, Columbus Chamber of Commerce.

Response—Jack Williams, Editor, Waycross Journal-Herald, Waycross, Ga.

President's Report—T. G. Woolford, At-
(Continued on Page 3)

Forestry-Geological Review

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CLAUDE E. BOGGS, EDITOR

Forestry Division

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Jack Thurmond, Asst. State
Forester.....Atlanta
Claude E. Boggs, Educational Mgr. Atlanta
T. P. Hursey, Dist. Forester.....Rome
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Geologist.....Atlanta
Miss Margaret Gann, Clerk.....Atlanta

Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

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seven combinations of cover type and land use. The study was carried on for a period of two years. Measurements were taken from small plots laid out on areas having a uniform 10 per cent slope.

Rainfall during the two years totalled 130.90 inches, or 25 per cent more than normal, occurring as 103 rains (or series of rain) from 0.03 to 5.32 inches each. About 28 per cent of the precipitation occurred as torrential rainfall, and 20 per cent as rains of moderate intensity.

For a plot in a cultivated cotton field in which the rows paralleled the slope, surface run-off amounted during the two years to 58 per cent of the total precipitation and in individual rains amounted to as much as 96 per cent of the precipitation. On this plot the rate of soil erosion exceeded 195 tons per acre for the two years. For a cultivated cotton field in which the rows paralleled the contour, run-off totaled 47 per cent of total precipitation and soil eroded during the two years totaled 69 tons per acre.

From barren plots in an old field there occurred during the two years a total run-off amounting to 48 per cent of the rainfall, and erosion totaling nearly 160 tons per acre.

In the two years, the run-off from unburned broomsedge plots in an old field amounted to only slightly more than 1 per cent of the rainfall, and that from oak forest to less than 1 per cent. During no rain did run-off from land of these two classes exceed 5.05 and 3.10 per cent of the rainfall, respectively. Erosion from

such lands was almost negligible; the quantity of soil washed from each forest plot was to the quantity lost from one cultivated plot as 1 is to 4,300.

Total run-off and erosion from plots in a plantation of black locust and Osage-orange, a Bermuda grass pasture, and scrub oak woodland were somewhat larger than these but were very much smaller than those from barren or cultivated land.

The results of the study are particularly valuable in giving a comparison of surface run-off and erosion losses for different types of cover and in indicating the approximate losses that might occur on larger areas or watersheds where the water tends to concentrate into streams.

The question might be asked how does litter or coverage check surface drainage and increase the underground water supply. The answer is that the coverage caused by forests leaves, etc., coming in contact with the soil, the porosity of the soil is increased.

In an experiment conducted by Central States Forest Experiment Station, Columbus, Ohio, it was proven very conclusively that soil from forest areas in 13 forest plantations was 13.6 per cent more porous than the soil from field plantations adjoining these forest areas. This increased the water absorption capacity of the forest soil to a great degree. The average rate of absorption per one inch depth for the forested area was 107 c. c. per minute as compared with 8 c. c. per minute for the cultivated areas.

The forest litter, therefore, affects the porosity of the soil very much. It also acts as an absorbent, acts as a mulch or insulation against rapid evaporation, prevents compaction of surface soil by the impact of rain, and decomposes and furnishes plant food.

The general conclusions derived from the above statements may be briefly summarized as follows:

1—That the forest litter is a means of increasing the absorption of water by the soil.

2—Forest litter contributes greatly to the ground storage of rainfall.

3—Forest litter has an immediate effect in reducing surface run-off.

The results emphasize the importance of reforestation as a means of reducing the surface drainage and increasing the underground water supply.

EXAMINATION FOR VOCATIONAL FORESTRY CAMP SCHOLARSHIP HELD APRIL 17

The examination to determine which vocational students shall attend the vocational forestry camp this summer was held on Friday, April 17.

There are 153 high schools in the state which include forestry along with their regular vocational classes. Each school where vocational agriculture is taught will

be eligible to send one student to the camp.

The camp will be held this year at Abraham Baldwin Agricultural College, Tifton, Georgia. Further details concerning the camp will be announced later.

CCC THREE YEARS OLD APRIL FIRST

Many Worthwhile Projects Completed Within this Period, with Many More in Process of Construction

Under the provisions of the Emergency Conservation Act, as passed by Congress in 1933, there came into official existence in the United States an organization which is known as the Civilian Conservation Corps. This organization began functioning on April 1 of the same year. The purpose of this organization was to provide employment for the idle youth of the country and to develop and conserve the forests and natural resources throughout the country.

The CCC Camps are working under the departments of Interior and Agriculture. Those working under the supervision of the Department of Interior are doing mainly construction work in the National and State Parks, in cooperation with the state park divisions—also working on various army posts throughout the United States, and Monumental Parks. Those working under the supervision of the Department of Agriculture are doing soil conservation work and forestry work. Those doing forestry work in Georgia have accomplished much during their existence. We wish to give a brief account of the work.

The fundamental aim of these camps is to get the forest area of the country in such shape that the land owners can better protect their timberlands from their greatest enemy—fire.

Since the act creating the CCC provided that work done by these camps should be on areas under some form of organized protection, Georgia received her quota of camps when they were first distributed. At that time Georgia had under organized protection approximately three million acres. Today there are over five million acres of forest land under organized protection.

In reviewing the work of the CCC camps in Georgia on forestry work, we find that many worthwhile projects have improved the forested areas of the state and helped to reduce the huge annual loss in dollars and cents of valuable timber from forest fires, insects, diseases, etc. In providing a means for reducing forest fires, a protective system has been carried out which we believe to be the best means of properly combatting the greatest enemy of the forest.

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the forests. The design of this protective system is primarily to provide adequate detection facilities, transportation and suppression measures. Each camp has done outstanding work along these lines, and by their efforts a large number of fires have been extinguished before much damage was done, and the area burned over therefore greatly reduced — more than before the camps were established.

Classifying the work done by these camps, we find that the timber protective organizations have received approximately 20,000 man-years of work; 68 fire towers have been constructed; 1,500 miles of telephone lines have been built; 5,000 miles of 20-foot firebreaks and 1,150 miles of 10-foot firebreaks have been constructed and over 900 miles of truck trails cleared. A total of 1,000 bridges have been built and more than six million acres of TPO land mapped. These maps will form the basis for the TPO fire control, plan and detection system.

Approximately 6,000 pounds of slash, longleaf and loblolly pine seed have been gathered during these three years by the camp boys for use at the state nurseries.

Maintenance work on telephone lines, towers and firebreaks as well as on truck trails has been done by the forestry camps. The boys have spent more than 40,000 man-days on fire suppression, and in many cases the CCC camp boys have been the sole reliance in fire suppression work.

These camps have not only been of material benefit to the communities, but they have been helpful to the enrollees themselves. Within the camps the boys have learned to live as a group. New friendships have been formed and contacts made that have given many of them new ideas of living. On the job many have learned the proper method of handling tools and equipment with safety, and many have gained knowledge that will be helpful after leaving camp.

A definite educational program has been carried on in these camps. Some have learned to write their names for the first time, while others have had an opportunity to study high school subjects. There have also been classes in woodcraft, model building, weaving, sheet metal work, photography, electrical engineering, mechanical engineering and such other educational work as will be of material benefit to the enrollee after leaving the camp.

The people of Georgia are grateful to those making it possible for so great a program to be carried on and are hopeful that funds may be provided to continue this program.

FORESTRY ASSOCIATION MEETING

(Continued from Page 1)

lanta, President. Georgia Forestry Association.

Address—"Evolution of Cooperative Fire Protection." W. M. Oettmeier, Superior Pine Products Company, Fargo.

Address—"Some of the Results of Forest Research during the Past Year." E. L. Demmon, Director, Southern Forest Experiment Station, New Orleans.

Address—"Industrial Water Resources Survey." C. E. McCashin, District Engineer, U. S. Geological Survey, Chattanooga.

Announcements—

Appointment of Committees, etc.

LUNCHEON—1:00 P. M., Ralston Hotel—Dr. Chas. H. Herty, Presiding.

Address—Judge G. Ogden Persons, Forsyth.

Afternoon Session

2:30 P. M. (Central Time)

W. T. Anderson, Macon—Presiding

Address—"Progress made by Civilian Conservation Corps" Robert Fechner, Director, E. C. W., Washington, D. C.

Address—"Vocational Education and Forestry." M. D. Collins, State Superintendent of Schools.

Address—"Forest Products Utilization." Jos. C. Kircher, Regional Forester, U. S. Forest Service, Atlanta.

BANQUET—Ralston Hotel. 7:30 P. M. (Central Time).

Toastmaster—Mr. T. G. Woolford.

Address—Dr. Chas. H. Herty.

Morning Session

May 8th—10:00 A. M. (Central Time)

Elliott Reed, Savannah—Presiding

Address—"The Present Situation of Southern Forests." Capt. I. F. Eldridge, U. S. Forest Service, New Orleans.

Address—"The Railroads and Forestry." Roland Turner, General Agricultural Agent, Southern Railway System, Atlanta.

Address—"Carpet Grass and Beef Cattle." James Fowler, Soperton.

Address—"Naval Stores and Forestry." H. L. Kayton, Savannah.

Report of Resolutions Committee.

Report of Nominating Committee.

Adjournment.

Trip to Fort Benning.

TREES

I think that I shall never see

A poem lovely as a tree.

A tree whose hungry mouth is pressed

Against the earth's sweet, flowing breast,

A tree that looks at God all day

And lifts her leafy arms to pray.

A tree that may in summer wear

A nest of robins in her hair;

Upon whose bosom snow has lain,

Who intimately lives with rain,

Poems are made by fools like me,

But only God can make a tree.

Joyce Kilmer.

PAPER MILL BEGINS BUYING WOOD

Mill at Savannah to Begin Operating Soon

In a recent issue of the Savannah Morning News, it is noted with much interest that plans were completed recently for furnishing a steady supply of wood to the new paper bag plant of the Union Bag and Paper Corporation in Savannah. Sam A. Allen of Pine Bluff, Arkansas, a veteran timberman, has been authorized to make the purchases. Mr. Allen has already arrived in Savannah and established offices.

A fleet of trucks will be operated to bring the wood to Savannah, the size of the fleet depending upon the number of farmers who will want to deliver their own wood. The company has contracted with a towing company to operate a system of transportation for the wood on the navigable waterways that traverse the woodlands within 125 miles of Savannah. Timber will be purchased on the stump and in the woods; wood will be delivered to highways or on good dirt roads; or wood may be delivered on barges within 30 miles of Savannah. Actual hauling of the wood will start about the 15th of May. The mill has announced that they cannot use all wood offered to them, but will endeavor to favor with orders the timber producers who practice forestry.

Those desiring information about disposing of their wood may write Mr. Allen, whose address is given above.

It is quite interesting to note that timber producers who practice forestry will be given first consideration. This company has learned by experience that trees from areas protected from fire, taken from areas where forestry practices have been observed will produce a better quality of paper, as well as other forest products.

This should be a warning to timber producers who do not now protect their forests from fire, that they should begin now this practice, as wood using industries will more and more be coming to the south in order to be near the source of supply, and this will mean a greater market for timber than ever before.

BEGIN NOW TO PROTECT YOUR WOODS FROM FIRE.

Paper was first made by the Egyptians over 4,000 years ago. They cut the stems of the papyrus plant in thin slices and laid them in rows and then arranged another row crosswise to the first row. The sheets were soaked in water and later pressed and dried. The result was crude paper upon which the kings wrote their edicts.

FIRST CARPET GRASS SOWN USING CCC LABOR

Ogeechee TPO Uses One Ton of Seed

Execution of the carpet grass and lespedeza firebreak project, conceived by Congressman Braswell Deen two years ago and backed by timbermen and cattlemen throughout the entire southeast, was launched recently with CCC workers sowing one ton of seed on firebreaks constructed by Ogeechee Timber Protective Organization in southeast Georgia.

Both lumbermen and cattlemen who previously have been at odds because they felt their needs conflicted, have united in this effort to replace wiregrass with other plantings for their mutual benefit. Carpet grass sown in firebreaks gives timbermen practical firebreaks, at the same time giving cattle good pasturage.

Jesse F. Jackson, General Agricultural Agent for the Central of Georgia Railroad and Perry Hubbard, Manager of the Ogeechee TPO, supervised the CCC workers in planting these seed.

The one ton of seed used planted at the rate of twelve pounds per acre, as required by the regulations that had to be furnished by individual owners or the T. P. O., as CCC labor can only be used in the planting. The individuals wishing to benefit from this arrangement must belong to timber protective organizations.

The Ogeechee timber protective organization, which embraces Chatham county, and parts of Effingham and Bryan, is planning to plant approximately 150 miles of firebreaks this season. The Canoochee TPO, near Swainsboro, is also reported to be very active along this line, as are other TPO's where a forestry camp is situated.

Ordinary firebreaks ranging from eight to twenty-five feet wide are plowed at intervals between trees. The carpet grass furnishes a thick, matted sod, difficult for fire to traverse, especially when cattle keep it grazed. Lespedeza increases the nutritional effect. Unlike wiregrass, it does not have to be burned so that it will sprout in the spring tender enough for cattle to eat.

Dr. Chas. H. Herty, noted in his work in developing products from pine pulp, and others vitally interested in forest preservation, members of timber protective organizations, Mr. Deen, cattlemen and others interested in the possibilities, felt that this recent work was a good beginning in get-

A tree is trustworthy; I can depend upon it, I can trust it to do what is expected of it. It faithfully stays in its place and does its work well.

A tree is loyal; it is true to the laws of its nature. It does not play double.

SOUTHEASTERN SECTION AM- ERICAN WATER WORKS ASSOCIATION

Held Interesting Meeting in Savan- nah, April 7, 8 and 9

The Southeastern Section of the American Water Works Association held an interesting meeting in the DeSoto Hotel, Savannah, Georgia, April 7, 8 and 9. There were discussions concerning improved methods of making municipal water plants more sanitary, thereby reducing the chance of having epidemics of various diseases in towns and cities.

An interesting discussion on the feasibility of using drilled wells for municipal water supply was led by Richard W. Smith, State Geologist. He stated that deep wells are the principal source of supply in the Coastal Plains region of Georgia, but are not at all reliable as municipal supplies in North Georgia.

The effect of reforestation upon surface drainage was brought out during the convention in a paper by C. E. Boggs, Educational Manager of the Georgia Forest Service. It was pointed out that forests do affect the surface drainage of water in that they provide a litter or cover for the ground which acts as an absorbent. This cover prevents the quick run-off of water which would cause erosion, or the carrying of mud and other substances into the municipal water supplies.

HORTICULTURAL GROUP DIS- CUSS TUNG OIL CULTIVATION

Possibility of Overdoing This Indus- try Pointed Out

At a meeting of the Horticultural Group of Georgia, held at the Experiment Station on March 7, among other subjects, there was a discussion on the cultivation of the tung oil tree. It was brought out in this discussion that this particular industry is just now in about the same condition that the pecan industry was twenty-five years ago, namely, that little is really known about it and that it is being greatly advertised. Therefore, there is a possibility that it may be overdone in the wrong way to the injury of the industry. The group recommends that before the tung oil tree is largely planted, more study should be made of the present plants, and that suitable varieties be established and that such varieties be planted only in the southern section of the state. It has been learned that some of the trees producing nuts high in oil content do not produce an oil that is up to the standard of the paint and varnish requirements. Therefore, varietal development should not be based on yields alone, but should take into consideration the quality and quantity of the oil produced.

GRAND JURORS OF DAWSON COUNTY RECOMMEND FIRE PROTECTION

It is very gratifying to note the interest that the judges of the Superior Courts of Georgia are taking in helping to protect the forests of our state from fire.

The Georgia Forestry Association recently mailed a letter to each Superior Court Judge in the state, urging that they call the attention of the grand juries and citizens of their districts to the great damage being done to our forests today by fire. Almost without an exception, each judge has responded to this appeal and has promised full cooperation.

Grand juries are making recommendations that action be taken by officials of the counties to prevent damage to the forests by fire. The recommendation of the Dawson County Grand Jury are being used as an example of what the grand juries in the state are doing. It follows:

"We, the Grand Jurors for the county of Dawson, in session at the regular March term of the Superior Court of said county having noted the negligence and unwarranted destruction of our woods by fire which causes untold damage to both land and products thereof; and which is causing great economic loss to this county both timber and soil erosion; and in an effort to curb this yearly destruction to our land, timber and products, do

Respectfully recommend:

That the police authorities of this county use their power in detecting the suspects and promoting such prosecutions under the laws of Georgia covering such crimes;

That the Board of County Commissioners make inquiry of the State Forest Service with a view to entering into cooperative fire protection under the state and governmental protective organization.

That the land owners of this county join in this good cause and thus help to suppress these yearly fires and thus enhance the value of our open lands and stop the uncalled for damage in order that the timber products and land may be held intact for ourselves and posterity. This the 19th day of March, 1936.

The Georgia Forest Service commends the grand jury of Dawson county for taking such a forward step in helping to protect the forest lands, and urges that all grand juries throughout the state follow this splendid example."

A tree is courteous; it behaves itself well, minds its own business, and does not intrude into the affairs of others.

A tree is obedient; it obeys the law of a higher power, and does as it is told, working in accordance with the rules.

FORESTRY WORK DONE ON HOME PROJECT

**Winner of Fourth Prize Offered by
Georgia Forestry Association
Student of Clarkesville
High School**

**J. VERN STANCIL
Clarkesville High School**

My forest project consists of about two and one-half acres of yellow pines. Since entering high school and taking up the study of vocational agriculture, I began to learn the importance of the forest and the industries derived from forest products.

About my home and community I noticed that there were lots of old, eroded hills on which nothing grew, but which would easily grow pine timber. Seeing this land washing away got me interested in the production of trees. As a result of this I selected two and one-half acres of yellow pines. The pines were very thick and some of the mature trees needed cutting. After cutting out the mature trees and hauling them to a shingle mill, I continued to thin my forest. From a study of vocational agriculture, I learned that the best method to go about thinning the forest was to cut all dead trees, trees that were subject to disease and fungi, as well as crooked trees and those that were hindering the growth of others that would some day amount to something.

After carefully thinning my project, it was necessary to plant a few seedlings. I secured the seedlings from a nearby saw mill where timber had been cut and seedlings were growing, which I transplanted to my forest project.

After thinning and transplanting was completed, I constructed a firebreak through the center of the plot to protect it from fire. The outer boundaries were surrounded by a natural firebreak, thus making the plot well protected from fire.

One day while looking over my timberland, I noticed where a terrace ran into my woodland. Upon investigating to see if my woodland was becoming eroded like the fields I had noticed, I found that in the woodland the erosion was being checked. After the water got into the woodland it spread out, washing up small terraces of pine needles. A little further down another small terrace had formed, and so on until several terraces of pine needles had been formed by the water from the outlet. One day shortly after a rain, I visited my project to see what the outlet of water was doing. I found that the small terraces formed by the pine needles were holding back the water and letting it run with a much slower speed, and the further in the woodland it traveled, the slower the water was running. These pine needles were

checking the flow of water on the floor of the forest and the water was finally absorbed as it went further into the woodlands.

If fire had been allowed to burn up the forest floor of this plot, the water would not have been slowed down, thus making the woodlands susceptible to gullies.

I have found it a very good practice to protect my project from fires. It is said and well said, that fires destroy more timber than man himself destroys. Compare a large tract of unburned timber with a large tract of burned timber. What do you suppose the result would be? You would find the timber on the burned-over land worth just about one-third as much as that on the tract that was unburned.

So make it a rule to protect your forest from fire.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

E. C. W.

P-68, Douglas, reports that the Fitzgerald side camp is nearing completion and will soon be ready for occupancy by the 50 negro juniors from the base camp. The people of Ben Hill and Irwin counties are very eager to see these men start to work and have cooperated in every way in the establishment of this side camp.

The Commanding Officer of P-92, Blythe Island, recently gave a "smoker" for the Brunswick-Peninsular TPO, a few citizens of Brunswick, the enrollees of P-92, and a few other guests from other camps and outside. This "smoker" was a rare treat and was a jolly get-together of good fellows. Major Harwell was Master of Ceremonies, and as usual, everyone enjoyed Major's wit and humor. Several good talks were made by the visitors and several enrollees were presented and said a few words. The "smoker" was followed by a dance but the writer was unable to attend and cannot give a report on that. However, my hat is off to Commanding Officer Smith and Project Superintendent Coxon as they believe in hard work and good clean amusement and they always seem to have a pleasant time at P-92.

A District "F" CCC Educational Conference has been called for April 20 and 21 at Blythe Island and the Superintendents of the camps in District "F" have been invited to attend. A good representation is expected and as the Forest Service is taking a very active interest in the educational programs in the camps it is expected that much useful information will be derived from this conference.

T. P. O.

At a meeting of the Brunswick-Peninsular TPO, Major W. L. Harwell was elected President of the TPO to succeed Col. R. E. Benedict, deceased. Col. Benedict had served as President of the Brunswick-Peninsular TPO since its organization and at the time of his death was very active in TPO affairs.

Major Harwell has served on the Board of Directors of the Brunswick-Peninsular TPO and has from the beginning taken a very active interest in the TPO. Major is Tax Commissioner of Glynn County, a prince of a good fellow, and a "jam-up" TPO President. The Brunswick-Peninsular TPO has taken on renewed vigor since the Major took the reins and now promises to be a first class TPO.

J. E. Lanier replaces R. P. Marsh as TPO Secretary for the Brunswick-Peninsular TPO. Lanier was recently employed by ECW.

The Appling County TPO has recently received from the City of Baxley a deed to a tract of land within the City limits and is planning to erect a TPO headquarters and dwelling house within the near future. This TPO has taken on new life within the past few months and is operating all of its equipment full time. A 100 ft. steel tower in the vicinity of Hazelhurst, being erected by P-62, Baxley, is now nearing completion and this tower adds to the effectiveness of the protection system.

The Hurricane Creek reports that they are real proud of their new 100 ft steel tower on the East side of the Alma-Baxley Highway about two miles north of Alma. This is the only tower that the Hurricane Creek TPO has but it is hoped that another one will be placed in Pierce County within the near future. This TPO is going full speed and is very active. All of the work done in this TPO has been done by TPO-owned equipment as they have never received any benefits from ECW with the exception of the tower mentioned above.

All of the TPOs in this District were handicapped somewhat in their work during the last quarter due to excessive rains but most of them turned in enough work to be in danger of exceeding their budget for the fiscal year, so, taken as a whole, the rains probably helped some.

SHADE

The kindest thing God ever made,
His hand of very healing laid
Upon a fevered world, is shade.
His glorious company of trees
Throw out their mantles, and on these
The dust-stained wanderers find ease.
Green temples, closed against the heat
On noontime's blinding glare and heat,
Open to any pilgrim's feet.

EIGHTH DISTRICT

H. D. Story, Jr., Dist. Forester
Albany

The Georgia Pine and the Georgia Peach

We have before us photographs of the typical Georgia Pine and Georgia Peach, both at the tender age of two and four years.

The Georgia Peach has been given constant care and attention under the watchful eyes of the parents, being sheltered from cold wintry winds, hot summer's Sun, storms, cloud-bursts, and other environmental agencies which would tend to retard the growth and development. Her limbs have never been exposed to breakage and other injuries, yet in her four years of life she has attained a marvelous growth height of approximately 40 inches.

On the other hand we will take the Georgia Pine which began its life of exposure four years ago in the Albany Forest Nursery. It has constantly kept its vigil during this period, being unable to rove around securing nourishment and shelter not provided by nature. It has taken the hot summer's Sun which has borne down with intense heat absorbing moisture from its needles and taxing its root system to an extreme. Its limbs have been buffeted by winds of high velocity and some have been broken. It has been covered with sleet and ice, flooded by torrential downpours, never given a caressing gesture, but in spite of all handicaps is developing rapidly, and

has attained several time the height of the Georgia Peach.

This Georgia pine, of which we have billions in the State and should have many more, although it began life with the Georgia Peach, has combatted its natural enemies and has now attained a size sufficient to stretch forth its branches protecting the Georgia Peach from the hot rays of the Sun and will go even farther as it, in all probability, will by the time the Georgia Peach has reached maturity, be able to furnish her with lumber for shelter and perhaps rayon for a pair of hose.

We have many men in the State of Georgia who will argue that pines cannot be grown quickly enough whereby they may receive the benefits, but it does not take a life-time to produce a tree of merchantable size; and even though these men through some cause or other are taken from their trails, pleasures, and troubles of this earth, there are not many who do not have a Georgia Peach to be provided for and sheltered through the parents effort and forethought.

For these reasons, why should we not, by protection, conservation, and reforestation, provide for the needs of our Georgia Peaches, and if the case may be, our Georgia Crackers?

GRAND BAY T. P. O., LAKELAND, GEORGIA

Mr. H. H. Jones, has been appointed secretary of the Grand Bay T. P. O. at Lakeland, Georgia, to succeed Mr Tom Murray, formerly employed in this capacity. Mr. Jones began his services March 15th.

ALBANY NURSERY

The deep well turbine pump recently purchased for the Albany Nursery has been installed and is giving satisfactory results.

Planting operation is completed and there is very favorable germination in approximately 75 per cent of the planted area.

Mr. Murphey, Nurseryman is making every effort to increase the available supply by at least 2,000,000 seedlings and while the demand is expected to be even greater this year it is hoped that the nursery will be able to supply somewhere near the demand.

FROM A GEOLOGIST'S NOTE-BOOK

The Georgia Mineral Society, continuing its program of monthly field trips, took an excursion on Saturday, April 18th to mineral localities in Cherokee and Pickens counties. Near Holly Springs, the party visited the mica and primary kaolin deposits of C. M. Wacaster, the serpentine quarry of the Georgia Marble Company, and the Cherokee Gold Mine. The party ate lunch along Town Creek where the fine grained mica phyllite containing large garnets was observed. The chlorite schist mine of the Thompson-Weinman Co., near Waleska and the marble quarries near Tate were also visited. Unusual specimens found included chlor-apatite from the serpentine quarry and the green mica, fuchsite, from the marble quarry at Tate. About 30 people participated in the trip.

Recent prominent visitors to the office of the State Geologist were Drs. C. Wythe Cooke and R. C. Cady, of the U. S. Geological Survey, and Dr. Sydney H. Ball, well known economic geologist and gemstone expert.

Richard W. Smith, State Geologist, attended the meeting of the Southeastern Section of the American Waterworks Association held in Savannah, Georgia, April 7, 8, and 9. Mr. Smith discussed a paper on drilled wells for municipal water supplies. He urged well drillers to keep adequate logs and borings for record with the State Geological Survey. He offered log blanks and sample bags to all Georgia drillers for this purpose.

R. W. Smith and G. W. Crickmay, of the State Geological Survey, attended meetings of the Georgia Academy of Science, held at Athens, Georgia, April 3 and 4. Dr. Crickmay addressed one of the sections on the weathering of granite rocks of the Southeast.

Lane Mitchell, Assistant State Geologist who attended meetings of the American Ceramic Society in Columbus, Ohio, recently, found a growing demand for Georgia clays. He also reported considerable interest manifested in kyanite and vermiculite, two newcomers to Georgia's commercial mineral ranks.



Two Years Old—Georgia Peach and Georgia Pine



Four Years Old—Georgia Peach and Georgia Pine

THE GEORGIA STATE MUSEUM

Reported by THE DIVISION OF GEOLOGY

Geoffrey W. Crickmay

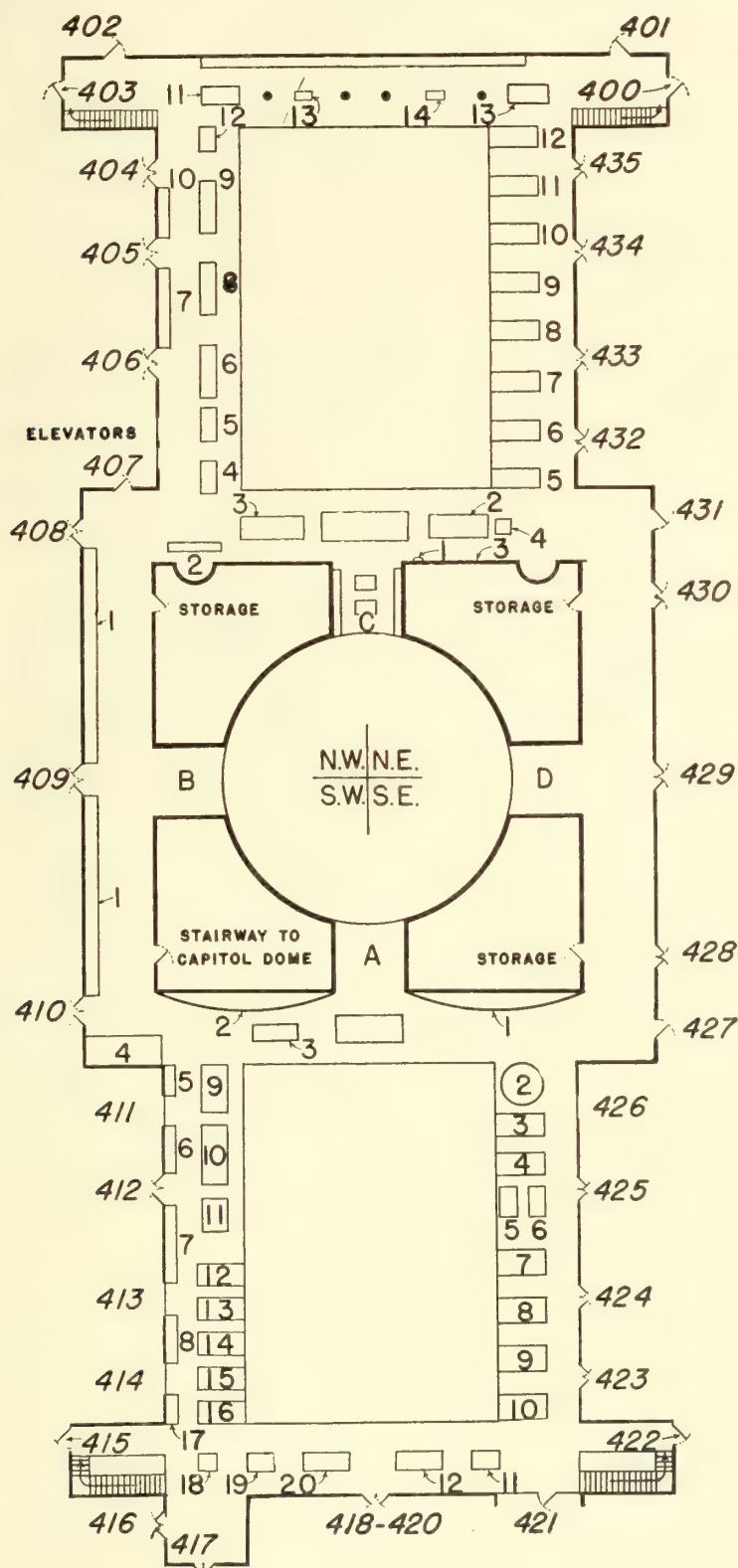


FIGURE 1—FLOOR PLAN OF STATE MUSEUM

Figure 1 is a plan of the fourth floor of the State Capitol showing the position of exhibition cases and offices. The floor in the diagram is divided arbitrarily into four quadrants, northeast (N.E.), northwest (N.W.), southeast (S.E.), and southwest (S.W.), and the cases are labelled consecutively in each quadrant. The central part is surrounded by four cubicles which are labelled A, B, C, and D. The room numbers are in oblique figures.

Offices:

Entomology	431-433
Forestry	434-435
Game and Fish	411-413
Geology	425-426
House Gallery	408-410
Industrial Relations, offices	418-421
hearing room	424
Ladies' Room	427
Library Commission	400-402
Men's Room	407
Pensions	404-406
Prison Commission	414-417
Senate Gallery	428-430
Soldier Roster Commission	403
Superior Court offices	422-423
Temporary offices of Forestry	
Department	408-410, A, B.

The Georgia State Museum was started in 1896 when material collected for the Georgia exhibit at the Cotton States and International Exposition of 1895 was turned over to Professor W. S. Yeates, State Geologist. Lacking any suitable museum in which to display these collections to advantage, they were placed temporarily in the corridors of the fourth floor of the Capitol, where they remain today. The Georgia exhibits at the Universal Exposition at St. Louis in 1904 were later added to the museum. These two collections became the nucleus of what has grown to be a very complete display of the natural resources of the State. The collection includes exhibits of Agriculture, Forestry, Mineralogy, Economic Geology, Paleontology, Ethnology, Entomology, Education, and Game and Fish.

Agricultural exhibits consist of displays of cotton, grain, fruits, nuts, and soils in cases S.E. 11-12, and S.W. 18-20. Particularly noteworthy is a cotton stalk from northern Fulton County upon which there are more than 700 open bolls, said to be a world's record (S.W. 18).

Forestry of the State is represented by a complete collection of tree sections showing the bark and character of wood cut and polished (S.E. 1-2, S.W. 2, and exhibit in front of cubicle A). Each tree section is tagged with a map showing the distribution of the species in the State. Exhibits of rustic furniture are to be found in the north corridor near case N.E. 14, and a maple mantle in the east corridor between rooms 427-428.

The mineral collections contain specimens of nearly every mineral known to occur in the State. These are arranged along the northeast corridor in cases N.E. 5-12, according to chemical composi-

interest include an exhibit of gem stones (S.E. 5), the William B. Pitts mineral collection (S.E. 4), school museum collection (S.E. 3), fluorescent minerals (N.W. 2). Rocks and miscellaneous minerals are to be found in cases N.W. 4, 7, and 10, and S.W. 14 and 16. Of special interest is the Social Circle meteorite (N.W. 13).

Economic Geology is one of the main interests of the Division of Geology and thus it is to be expected that commercial minerals of the State should receive a large share of available space. The collections include displays of non-metallic minerals with products manufactured from them; Kaolin and products (N.W. 5, 8), Clay, brick, and tile (N.W. 9), Asbestos and lubricants (north corridor near N.E. 13), building stones cut in eight-inch cubes of which each face is differently finished (in front of cubicle C). Marble columns are in the north corridor. Of particular interest is a large slab of polished marble (N.E. 3) which consists of four pieces sawed from the same block and mounted so that the grain of each matches in a continuous pattern. The ore minerals include Bauxite and aluminum products (N.W. 6), Iron ores, both soft oxides (N.E. 14, N.W. 3) and hard sulphides (N.E. 13), Gold (north corridor near N.W. 13) and gold nuggets (S.E. 6), Manganese ores (north corridor near N.E. 14).

Paleontology (study of past life of the earth) is represented by a number of fossils ranging from very ancient forms of life to very recent (S.W. 12, 15, and N.W. 7, 10). Space does not permit additions to the fossil exhibits even though these highly interesting records of life in ages past have much popular appeal. Three exhibits of particular interest are ancient trees of the type which make up part of some coal beds (N.W. 7), petrified tree trunk (N.E. 1), and teeth of prehistoric horse, mammoth, and mastodon (S.W. 12).

Ethnology (study of prehistoric man) has unfortunately not had the undivided interest of one department, and therefore the exhibits in this field are limited to a few implements, bowls, pipes, and arrow heads (S.W. 13, N.W. 4). The recent excavations at Macon have shown that Georgia has a wealth of ethnological material which is worthy of preservation and display. New material is constantly being unearthed but without an adequate museum for its preservation Georgia stands to lose specimens which can never be replaced or duplicated. When a Georgia State Museum is built it should be provided with a hall of ethnology.

Entomology has exhibits showing the destructive work done by insects, parasitic plants, and other pests to the crops and forests of Georgia (S.E. 7-10). The display is intended to show the various types of pests and disease so that proper control methods can be applied but the effectiveness of the exhibit is marred by the fact that the cases themselves are so old that

they, too, show the injurious activity of insects. Most of the cases in the museum are more than thirty years old, and it is long past time when they should be replaced by modern steel cases.

Educational cases (in cubicle C) consist of specimens of work done by pupils in public schools.

Game and Fish exhibits include a large collection of native birds (S.W. 1, 5, 7-9, 17), a habitat group (S.W. 4) showing several animals against their native background, and a collection of bird eggs (S.W. 3). There is an instructive case on snakes and snake-bite remedies (S.W. 10). Whales are strictly neither game nor fish but the collections contain two whale jawbones (cubicle D) which attract much attention.

A state museum has inestimable value if it displays to advantage the resources and natural history of the state. It advertises and it educates in a way that can not be duplicated by the written report, and it affords a safe depository for historic and prehistoric records. The poorly lighted corridors of the Capitol do not constitute a good museum, and it is high time efforts were made towards the erection of a permanent museum built on proportions commensurate with Georgia's wealth of natural history. A museum is one of those things whose value can not be expressed in dollars and cents. It may be expensive to build but no state which has gone to this expense has ever failed to maintain and add to the museum. Much of our Georgia material finds its way into the large museums of the north because there is no state museum. A case in point is the recent finds of mammoth and mastodon near Savannah. Museum staffs in other states are eager to obtain specimens from this find but the material retained for exhibition in Georgia remains packed in boxes in a stable. For forty years the Georgia exhibits have been resting in a temporary position waiting for appropriate action from the State Legislature. Is it to remain this way? Or is Georgia to demonstrate that she is equally or more progressive than her neighbors?

NEW MINERALS FOUND IN STONE MOUNTAIN GRANITE

The field trip to Stone Mountain, held by the Georgia Mineral Society on March 14th, resulted in finding some very unusual specimens. Although the trip was mentioned in the April issue of this publication, identification of the very rare minerals was not then complete. An analysis of the samples taken from pegmatite dikes in the quarries indicated the following minerals:

Mica, both black (biotite) and white (muscovite), occurs in the pegmatites but is uncommon at the Ethel quarry.

Microcline, a white potassium feldspar, common.

Quartz, the ordinary white, vitreous variety, common.

Tourmaline, a black colored, complex borosilicate of aluminum, soda, and iron. Prismatic crystals with characteristic triangular cross-sections are common.

Calcite, in pale green aggregates, uncommon.

Zoisite occurs in three distinct forms but may include clino-zoisite. Both belong to the epidote group and both have the same chemical formula, calcium aluminum silicate, but clino-zoisite, as indicated by its name, has inclined extinction. Pin-zoisite, thulite, is in irregular grains enclosed in microcline and quartz; brookite is in irregular aggregates associated with microcline; grey-green epidote is distinct prisms with striated faces. The brown and green varieties differ optically from the pink. The latter is a manganese zoisite. Thulite has not previously been found in Georgia and zoisite has not previously been found at Stone Mountain.

Axinite is a borosilicate of calcium and aluminum. It occurs in grains with partial development of crystal faces. The color is brownish gray, lustre vitreous, cleavage indistinct, hardness 7. The mineral resembles smoky quartz, but has distinctive optical properties. This mineral has not previously been noted in Georgia.

Garnet occurs as small red crystals both in pegmatite and granite and in very fine grain form in small veinlets.

The granite and pegmatites are cut by horizontal joints, and upon these joints hyalite and uranophane have been deposited in thin films. These minerals are distinctly later than the pegmatites and probably do not belong to the time of elevated temperature which characterized the metamorphic period, but were deposited by cold or only slightly warm water. The origin of these solutions is not known.

Hyalite at the Ethel quarry has a pale green color and is very strongly fluorescent under the argon bulb, mercury arc, and iron arc. The green hyalite is generally far more fluorescent than the white. The green hyalite owes its color to fluorescence by ultra-violet rays in sunlight, but the color is not apparent under electric light, or in sunlight when a suitable film is interposed.

Uranophane is a sulphur yellow calcium uranium silicate. Good specimens were collected at the quarry of the Stone Mountain Granite Corporation.

G. W. C.

About 1,100 different species of trees are found in the United States.

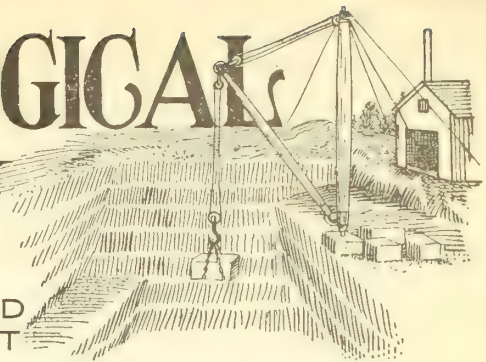
A properly cut blaze or mark will nearly always remain visible regardless of tree growth.

The oldest living thing on earth is thought to be the Yew Tree in Chapultepec, Mexico, 119 feet around, and 6,000 years old.



FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT



Vol. 6

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No. 6

STREAM GAUGING AND WATER SURVEY URGED AT GEORGIA FORESTRY MEETING

Columbus Meeting Attended by Many Who Are Vitally Interested in Forestry. . . Forest Experts Warn Against Timber Waste. Bright Future Seen for Pulp Industry.

The fifteenth annual meeting of the Georgia Forestry Association, held at Columbus, May 7 and 8, was attended by a large number who are vitally interested in forestry, and in many respects was a very important meeting.

Among the various subjects discussed, probably the most important constructive suggestion offered during the meeting was, that necessary funds for cooperating with the United States Geological Survey in conducting a water survey and gauging the streams of the state be raised as quickly as possible. It was pointed out that many industries are beginning to look to Georgia as a possible place to locate, and that they require certain information as to the flow of streams and quality of the water before they will locate. It was quite unfortunate that Georgia does not have any records of this nature at present, and it is important that funds be raised to obtain these records.

The association expressed itself as delighted with the hospitality of Columbus and the cooperation of the Columbus Chamber of Commerce. The delegates were entertained at a luncheon and a banquet.

T. Guy Woolford was re-elected as president, with Elliot Reed, of Savannah, as secretary, and Jos. A. McCord, Atlanta, re-elected as Treasurer.

The association will hold its meeting next year at Athens.

Opening Session

The invocation was offered by Rev. Henry G. Walker, of Columbus. In the absence of K. S. Worthy, President, Columbus Chamber of Commerce, who was scheduled to make the address of welcome, W. Fielder, Chairman of the local committee on arrangements, extended a very hearty and cordial welcome, to which W. Anderson, Editor, Macon Telegraph, responded with appreciation and with thanks to the City of Columbus, to the Columbus

Chamber of Commerce and to the Local Committee on Arrangements for their fine spirit of cooperation. Mr. Anderson discussed briefly the importance of the association's activities to the economic life of the state and expressed the hope that the meeting would result in much good. He expressed his pleasure in again being in Columbus.

President's Report

In making his annual report, President Woolford expressed his pleasure in being able to attend the Fifteenth annual meeting of the Association, stating that it was the eighth consecutive annual meeting which he has had the pleasure of attending. During these eight years Mr. Woolford stated that forestry has made remarkable progress, both in the growing of trees and knowledge as to how to take care of the forests.

A brief history of the Association was given, in which Mr. Woolford pointed out that the Georgia Forestry Association was organized in January 1921. The Georgia Forestry Committee of the Southern Forestry Congress passed the following resolution at their annual meeting held in Atlanta January 30, 1921: "Resolved, That this committee as organized also function as the Georgia Forestry Association until such time as the Executive Committee sees fit to call a state convention to elect officers, adopt a constitution and by-laws, and other details for a permanent and distinctive organization to be acted upon by the qualified voting membership of this committee of said convention." Pursuant to this resolution, an organization meeting was called in Macon, June 6-7, 1922. At this meeting Bonnell Stone was elected as the first president.

In addition to the educational and inspirational value of the annual meetings of the association Mr. Woolford pointed with very much pride to various accom-

(Continued on Page 2)

Paper Industry Moves Southward

New Development Announced Recently by Dr. Herty

Many arguments have been used by paper makers of the north to discourage this industry from coming to the south and establishing mills. Along with the fact that the paper manufacturers of the north did not want to disband their mills and bring them to the south, which would entail great expense to them, they argued that paper could not be made from southern pines.

Dr. Chas. H. Herty, who has worked faithfully in the paper and pulp laboratory at Savannah, has definitely proven that newsprint can be made from southern pines. He recently announced that newsprint can be made from practically every pine that grows in Georgia, or anywhere else in the south. His experiments show that the same quality of paper and pulp can be made from both fast growing and slow growing species.

The arguments used by the paper makers of the north have been met by facts and figures by Dr. Herty to prove that paper can not only be made from pines of the south, but can be made at a cheaper price. According to his figures newsprint of the quality that would cost \$47.48 to produce in the north can be made from southern pines for \$27.50. Dr. Herty also states that pulp for making rayon costing \$70 plus freight charges to the south, can be made from southern pines for \$35 per ton. The paper makers of the north also argue that the pulp made from southern pines will not be of good enough quality to make paper for use on large mills which have terrific speed. This argument has been challenged by Dr. Herty who sent three tons of pulp made from southern pines to paper machines in Canada. The paper made from this pulp made on these machines was of a quality equal to any in the entire country.

Since Dr. Herty has so successfully demonstrated the facts regarding the manufacture of paper and pulp from southern pines, it is interesting to note that paper industries are beginning to look to the south as a source of wood supply for making

(Continued on Page 5)

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CLAUDE E. BOGGS, EDITOR

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

Forestry Meeting

(Continued from Page 1)

plishments in which the association has had a part. He referred to some of the unusual resolutions of the Macon meeting in 1935.

The resolution requesting the judges of the superior courts to charge grand juries in regard to forest fires was mentioned first. Practically all judges received this suggestion graciously and acted upon it. The Project to survey the route of the De Soto Expedition was endorsed. A resolution covering a memorial to Bonnell Stone, the Father of Forestry in Georgia, was duly approved and the monument has been erected on the lookout plateau at Neel's Gap, a point he loved so well, in Vogel State Park. Other resolutions were referred to, which clearly showed that the association has been very active in promoting the interest of better forestry in the state.

It was pointed out by the president that much progress has been made during recent years in developing the paper and pulp industry in the Southeast, especially in Georgia. He stated that shortly southern mills, one at Savannah, and one at Crossett, Arkansas, would make "by far the larger part of Kraft paper manufactured in the South." It was only in 1928 that the forest service laboratories in Madison, Wisconsin, were saying that the southern pine was too resinous in its content to be considered as satisfactory pulp for news print. Experiments conducted by

Dr. Chas. H. Herty have completely disqualified these statements, and today the southeast is considered the best source for wood for making pulp and news print.

Mr. Woolford was very optimistic as to the future of the forestry, stating that it is generally conceded that our forests are growing faster than we are cutting them down. Our lumber is not of the same quality, of course, as that of the old original forests, but it is increasing in quality, and quantity. There seems to be a general feeling that forestry is gradually coming into its own, and is learning to understand itself, its limitations, and its possibilities. We can look forward to the future with confidence, provided we understand the fundamentals of forestry development, growth, preservation, and care.

Regarding parks: Mr. Woolford stated that much progress had been made during recent years in developing a good system of parks in Georgia, pointing out that the parks at Indian Springs and Vogel Park have been greatly enlarged and expanded. The park at Santo Domingo near Darien was dedicated and opened to the public last November. The park at Crawfordville is nearly completed. The park at Fort Mountain, near Dalton, is being developed, with other parks at Warm Springs, Albany and McRae well under way.

Cooperative Fire Protection

In speaking on "Evolution of Cooperative Fire Protection," W. M. Oettmeier, Manager, Superior Pine Products Company, Fargo, Georgia, stated that fire protection and forestry education in the state of Georgia are continuously moving forward with ever increasing strides and that each year brings us closer to the goal at which we are aiming. Mr. Oettmeier praised the members of the CCC Camps for their services in helping protect the forest from fires and other improvements in the forests. He stated that the landowners of the state could have never afforded the construction of wide firebreaks and truck trails which are an absolute necessity, and that the fire protection afforded by the CCC and emergency conservation work program was probably the beginning of our greatest advancement.

Mr. Oettmeier stated that the general outlook for the forests of Georgia today is probably brighter than at any other time in the past. People are gradually beginning to see the light, and the prospect for absolute fire protection is not in the far distant future.

Forest Research

In telling of some of the results of the forest research conducted at the Southern Forest Experiment Station, which is one of twelve research stations of the U. S. Forest Service, located at New Orleans, La., E. L. Demmons, director of the station said that research is being conducted in reforestation, timber growing, protection,

forest economics, and related subjects which will serve as the scientific basis for the practice of forestry, and in this way assist in promoting the full use for timber growing and other purposes of the one hundred and thirty-five million acres of commercial forest lands in the southeast.

Some of the major accomplishments of the station during the past year was given as: Publishing of the bulletin "Artificial Reforestation in the Southern Pine Region," which gives the results of the last ten years research on seed, nursery and planting; the result of the first year work of a turpentine experiment in southern Georgia, the result of using sulphuric acid on black locust seed to hasten germination; the result of a truck-logging and a mill scale study in the shortleaf-loblolly pine region. A cost production study of longleaf pine was made, which indicated that all sizes of trees yield a profit when cut into pulp wood, but only those trees ten inches in diameter can be used profitably in the production of resin barrels. From a study of land ownership, valuations, taxations, tax-delinquency and public finance made in southeast Georgia Mr. Demmon pointed out that 2,700,000 acres of Georgia forest land is tax default. Most of this represents land from which good timber has been cut, and when the owner is unwilling or unable to pay taxes. From a study of the Land Abandonment in the lower Piedmont Region of Georgia it was found that although over four-fifths of the land area of this region had previously been cleared for farms, at present only twenty-two percent is growing agricultural crops. Severe erosion of the soil, that has rendered much of this land physically unsuited to farming, is one of the chief reasons for this abandonment. Much of this abandoned land has been seeded to pine trees, and forests now occupy fifty-six percent of the total area of this region.

Industrial Water Resources Survey

In discussing this topic, C. E. McCaskey, District Engineer, U. S. Geological Survey stressed the importance of having records of water flow in inducing new industries to come to Georgia. It is very necessary to have a large quantity of water in operating a paper and pulp mill. The first question asked by people who are inquiring as to the possibility of locating such new industries in Georgia is: how much does your streams flow? Today we cannot give any accurate records as to the flow of any particular stream in Georgia. Mr. McCaskey stated that Georgia is the only state of the adjoining states that is not cooperating with the U. S. Geological Survey in obtaining such records, and that Georgia will find it to her advantage to fall in line with adjacent states in making an inventory of her water resources. He stated

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Forestry Meeting

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that the U. S. Geological Survey is prepared to cooperate with the state in obtaining and publishing the records of the stream flow so vital to growth and progress. The survey has a trained personnel and has most modern equipment for this purpose. During the fiscal year 1936 the Federal funds available for this work enables the survey to match every dollar of state money with eighty-five cents of Federal money, and that after July 1936 the cooperation will be on a fifty-fifty basis.

Mr. McCashin stated that it would be necessary for the state to raise ten thousand dollars per year, to be matched by an equal amount from the U. S. Geological Survey, to establish and maintain sixty stream gauging stations. This number should be increased from year to year as more funds are available, in order that accurate records might be obtained on as many streams as possible.

Luncheon

A very delightful luncheon was given to those attending the convention, at the Ralston Hotel. Dr. Chas. H. Herty acted as Toastmaster.

Judge G. Ogden Persons, delivering the principal speech briefly, but very interestingly, outlined the Forestry Movement in Georgia since it first begun. He said that this movement first started when a few Georgians, under the leadership of Bonnell Stone, met in Atlanta, Georgia, January 30, 1921, and organized the Georgia Forestry Committee. Resolutions were passed at this meeting outlining its aims as: To begin "the most important work of promoting the interest in the subject of forestry—to be continued on a well defined plan and program for organizing forestry clubs in Georgia." Money for this work was subscribed for the necessary educational and publicity campaign, and the hiring of an Executive Secretary, who was to devote his entire time to field work. This committee was to function as The Georgia Forestry Association until an organization meeting could be held, which later was called to meet in Macon, June 6-7, 1921, when Bonnell Stone was elected as the first President of the Georgia Forestry Association. UP UNTIL THIS TIME THERE WAS NO LAW PROMOTING THE INTEREST OF FORESTRY.

The Georgia Forestry Association immediately began to function, and sponsored at the Summer Session of the 1921 Georgia General Assembly a bill creating: THE GEORGIA STATE BOARD OF FORESTRY, which is described in the caption of the ACT as an "Investigating Committee."

The duties of the members of this Board of Forestry was "To inquire into and investigate the condition of the state as to its forest resources and timber supply; its idle land suitable for reforestation, the

benefits, if any, being derived from existing forest laws, and all matters pertaining to forest protection in the state, also benefits to be derived from Federal Aid for forest protection and conservation. To make such reports to the General Assembly as the Board may recommend. There were no existing forest laws previous to this time save the ACT of 1903 prescribing the adulteration of turpentine.

During the time from its organization to the passing of the Clark-McNary ACT, The Georgia Forestry Association has been very active, and has held annual conventions to interest the public and those engaged in forestry products, in the subject of forestry, its development and conservation. It had now become time to enact a more comprehensive Forest Law, and the Association sponsored the enactment of the present law by the Legislature in August 1925, which created the present Board of Forestry. It is the declared policy of this state to encourage reforestation of cut-over lands, and timber culture in general on all lands not better suited for farming or other purposes.

Under the ACTS of 1931 the Departments of Forestry and Geology were combined under the title of: The Department of Forestry and Geological Development.

Dr. George Foster Peabody gave a short talk, telling of his interest in forestry, and expressing his delight in seeing the interest in forestry being manifested by such a large and enthusiastic group as the Georgia Forestry Association. He complimented the members of the Association for the splendid work they are doing in promoting better forestry practices in our state.

CCC Work

Speaking for Robert Fechner, Director of ECW work, who was scheduled to speak, Charles H. Taylor, Assistant Director, very interestingly told of the accomplishment of the CCC Camps throughout the entire United States. After relating the accomplishments of the Camps over the entire United States, Mr. Taylor told the Association of the benefits Georgia had derived by having the Camps. He stated that: work figures forwarded to the Office of the Director show that among the major work projects completed by the CCC in the state of Georgia during the period from April, 1933, through December 31, 1935, were the construction of 1,847 miles of roads and truck trails as a fire protection measure, the stringing of 1,354 miles of telephone lines to provide instant communication in case of fire, the reduction of fire hazards over 130,568 acres of forest land and 924 miles of road and trailside, the improvement of 54,349 acres of forest land through elimination of inferior trees, the construction of 34,513 check dams as a soil erosion prevention measure and the carrying on of other soil erosion prevention operations over 12,445 acres, the moving

and planting of 146,796 trees and shrubs for landscaping, the planting of 1,425,000 trees on denuded areas, and the conduct of timber estimating surveys over 3,723,714 acres.

Protection of the forest areas of Georgia from fire and the development of recreational facilities within them have been some of the primary achievements of the Civilian Conservation Corps camps established in the state in the past three years.

Fire prevention, fighting and general control measures have aided state, private and federal plans to restore the forest areas in the state to productivity, for timber growing conditions are excellent throughout the state and need only the control of fire to allow natural reproduction to take place successfully.

The work of the CCC in the state has been on three different classifications of land with, however, the emphasis in each case placed on fire control.

Fire protection is being extended by means of the CCC to many thousands of acres of PRIVATE FOREST LAND through the state. These lands, through cooperation of their owners with state and federal forest agencies, are being brought under a program of fire protection which includes the construction of truck trails and telephone lines and fire breaks and the clearance of fire hazards throughout wooded areas and from roads and trail-sides.

Fire protection is also the major work of the CCC camps established on the military reservations in Georgia. The advent of the corps made it possible for Army and Forest Service officials to put into effect plans for the protection and forest administration of these areas. Camps have been located on the reservations at Fort Benning and Fort McPherson and on the Andersonville National Cemetery.

During the three years the Civilian Conservation Corps has been in operation this relief and reforestation Organization has supplied direct employment for varying periods of time to an aggregate of 33,608 Georgia men. Of these 30,011 were young men and war veterans enrolled in the corps. The balance consisted of reserve officers in charge of the camps, foresters and other technical personnel engaged to plan and supervise work programs, skilled and unskilled mechanics and educational advisers. As of March 1, 1936, there were 10,876 Georgia men in the Civilian Conservation Corps.

Figures based on reports from the Chief of Finance of the U. S. Army disclose that CCC obligations for the state of Georgia through March 20, 1936, had been approximately \$28,865,000.

Vocational Education and Forestry

In discussing Vocational Education as it applies to Forestry, Dr. M. D. Collins,

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Forestry Meeting

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State Superintendent of Schools, said that the people of this state should be proud of the fact that the growth and development of vocational education in Georgia, as well as in the United States, has been made possible, in part, if not largely, by Georgians. Not only have Georgians led in securing national legislation for vocational education, they have also led in launching other worthwhile programs of value to the people of the state. According to vocational leaders, Georgia has the most unique and practical method of teaching forestry now in operation in the United States. This program of forestry education was started in Georgia seven years ago. It is being carried on, on a cooperative basis by the Georgia Forest Service and the department of vocational education, of the State Department of Education. Georgia was the first to start such a program. Since it was started several states have adopted the Georgia plan.

Dr. Collins stated that since the inauguration of the forestry educational program from four to seven thousand farm boys have been given practical training, each year, by vocational teachers in such jobs as the collection, care and marketing of tree seed; making and operating a seed bed; construction of fire breaks; identification of trees; uses of wood; harvesting and marketing timber; thinning and improvement cutting; and estimating the volume of standing timber.

He further pointed out that the conservation and the development of our forest resources depends largely on the development and training of farm youth of the state, who are the future farmers and the future foresters of our state.

Forest Products and Utilization

In discussing this subject, Chas. F. Evans, speaking in the absence of Jos. C. Kircher, pointed out the invasion of Georgia by the paper and pulp mills, hailed as a blessing, can prove a curse if the forest lands of Georgia are not sensibly managed for a continuous yield of pulp and paper. You already know that timber down to four inches in diameter can be used for pulp, and statements have already been made that pulp can be grown on very short rotations. If we allow pulp mills to come in and clear-cut our stands at a young age, it will not be long before our stands will be ruined and the country be devastated.

We must base our forest management not upon the production of one single crop, such as pulpwood and turpentine, but upon a combination of these products which the forest will yield, starting with pulp wood and ending with a high grade material such as pole, piling, or saw timber. No opportunity should be overlooked, however, to encourage pulp mills to establish in

Georgia, but let us remember that when we do get them, we must give them the products of our forests taken out as thinnings and not as a final crop.

Banquet

The banquet program Thursday evening was featured by the address of Dr. Chas. H. Herty, Director of the Paper and Pulp Laboratory in Savannah. President T. Guy Woolford acted as Toastmaster.

A Glee Club composed of negro enrollees from the CCC Camp at Fort Benning entertained those attending the banquet very delightfully with a group of Negro Spirituals.

In his address Dr. Herty gave facts and figures which very plainly prove that pulp and newsprint can be made from the southern pines much cheaper and of as good quality as that made from northern woods.

Samples of beautiful white pulp and samples of newsprint made from Southern pines were displayed by Dr. Herty.

Situation of Southern Forests

Captain I. F. Eldridge, of the United States Forest Service, speaking on the program Friday afternoon said: The Deep South is commonly regarded as an agricultural country. Cotton is King—and after cotton, tobacco, corn and cane. Actually it is a timber country. The Forest Survey shows that over sixty percent of the land area is in forest. Only twenty percent is in actual cultivation and five percent in pasture. The rest is in abandoned crop land, towns, roads, other right of ways, and marsh. After more than one hundred years of intensive development for agriculture, fifty-eight percent of the state of Georgia is still in some stage of forest growth. In every Survey unit thus far traversed, the area in forest has been found to be increasing—the area in crops decreasing. It is high time that the South realizes its main stock in trade and becomes forest-minded.

In twelve survey units for which data have been computed, containing 82 million acres (less than half of the Deep South) 54 million acres are forest land. Seventy-six percent of this forest land supports second-growth timber. Fifteen percent is still in old-growth timber. Only nine percent has failed as yet to restock itself. The timber on this 54 million acres, converted to cords, totals 441 million cords or eight cords per forest acre. The present annual growth is 18 million cords, the drain by use eight and a half million cords.

Were as much effort given to developing the South's forest resources as is given to developing its agriculture, the benefits would reach every part of the South and every phase of industrial and commercial activity.

With proper forest management, growth might be doubled.

The South's future is unescapably tied

up to its forest resource. If fully developed and wisely used this tremendous and growing asset will solve most of the serious problems, both social and economic, that face us.

Railroads and Forestry

Roland Turner, General Agricultural Agent for the Southern Railroad, told of the relation forestry has to railroads, saying that if the forest of our state were made more attractive by improving them taking out ugly and deformed trees and planting some shrubs, flowers and attractive trees, that more people would ride the railroads into our state and visit our forests. He told also of the economic importance of the forest to the railroads, in that the railroads derived a goodly portion of their revenue from transporting forest products. He urged that we practice better forestry thereby producing better forest products, and in the end deriving more income from our forests.

Carpet Grass and Beef Cattle

In discussing this subject, James A. Fowler, prominent Truett County timberman, very interestingly told of his experience in using Carpet Grass not only as fire protection, but for fattening beef cattle, thereby making it bring him revenue in two ways. Mr. Fowler has been very successful in the raising of carpet grass among his pines, and at the same time has fattened several hundred head of beef cattle, which brought him a large sum of money. Other timbermen, seeing the success Mr. Fowler has had with this combination, are beginning to follow his example.

Naval Stores and Forestry

Saying that attempts to raise price levels artificially has resulted disastrously, H. L. Keyton, Secretary to the Georgia Forestry Association advocated research and advertising to improve the lot of naval stores produced. Experience has shown that at low markets the consumption of turpentine increases, that the demand decreases when the prices are high. This is because substitutes have been found for naval stores products when the market is high.

Mr. Keyton said "It is estimated that the Commodity Credit Corporation has sustained a loss of at least \$1,500.00 through its loan in 1934 and 1935 to the naval stores producers in an attempt to advance and maintain the market quotations of resin and turpentine. Prices are lower today than they were when the move was first initiated.

Had an equal amount been set aside for the purpose of research and advertising, a program running over a long period of years could have been established and work of a constructive nature been assured. Wider uses and lower costs of production was suggested by Mr. Keyton as the solution to the naval stores problems.

Paper Industry

(Continued from Page 1)

paper and paper products. In a recent issue of the Manufacturers' Guide, statements were made to prove that paper industries were looking to the south with a great deal of interest. According to their statement, paper plant projects recently established in the south, under way, or scheduled will total more than \$13,000,000.

The latest general contract to be awarded is that of the Kraft Pulp and Paper Mill for the Crossett Lumber Company at Crossett, Arkansas, which is estimated to involve an investment of \$4,000,000.

Information has also just been received that the Container Company of America has picked a site at Fernandina, Florida, and that negotiations are under way for establishing two other major paper plants along the Atlantic Seaboard, one of which will probably be located at Brunswick.

A contract has been let for establishing a paper and pulp mill of the Champion Paper and Fibre Company of Hamilton, Ohio, and Canton, N. C., on the ship canal to Houston, Texas. At the John H. Heald Company's plant at Lynchburg, Virginia, an expansion program involving an outlay of approximately \$500,000 is being completed for the making of liner board.

From these various expansion and development programs, one can readily see that the manufacturers of paper and paper products, and wood products are beginning to look to the south for timber supplies for the manufacture of these various products. Therefore, timber owners of the south should protect their forest lands from fire as they never have before, in order that they may be able to dispose of their timber at a price that will give them a profit.

SIXTH DISTRICT

W. G. Wallace, Dist. Forester,
Savannah

Two Steel Towers Erected by CCC

Of especial interest to those interested in forest fire protection in Southeast Georgia, is the announcement that two one hundred foot steel lookout towers have just been completed by the CCC at Reidsville and Swainsboro. The tower at Reidsville is located on the Tar City TPO in Tattnall County, and the other tower was constructed on the Canoochee TPO near Oak Park, Georgia on State Highway No. 4.

CCC Superintendents Attend Georgia Forestry Association Meeting

Superintendents McCranie, Peagler and Jackson, all of the Savannah District, attended the annual meeting of the Georgia

Forestry Association in Columbus last month. Each has expressed himself as having enjoyed the meeting and as having profited from the information brought out at the meeting. Of especial interest was the illustrated lecture given by Capt. I. F. Eldridge of the Forest Survey. The Camp Superintendents, from the information learned at the meeting, will be better able to help the TPO's in their camp areas to educate the people regarding the value of properly growing trees for profit.

Union Bag Paper Mill Beginning Operations

The Union Bag and Paper Corporation mill at Savannah, the first to be established in Georgia following Dr. Charles H. Herty's experiments in pulp and paper manufacture from Southern Pines, announced the beginning of woods operations about May 15th. Actual paper making will begin in July, but shipments of pulp wood were begun shortly after the middle of May.

Mr. J. H. Allen, Director, has had a wide experience in locating pulp and paper mills in the South. Of especial interest is the fact that he has placed some 500,000 acres of pine timberland under management in the South, prior to coming to Savannah. His company now owns approximately 60,000 acres of timberland in Georgia, which will be managed intensively for sustained yield production of pulp wood.

We note with great interest the policy of the Union Bag Paper Mill, regarding forest management and fire protection by landowners from whom pulp wood is purchased. All landowners from whom pulp wood is purchased, are encouraged to sign a pledge calling for fire protection and sustained yield management. The paper mill, through its forester, Mr. Albert Ernest, will assist the landowners in carrying out the policy of the company. Success of this program depends on the cooperation and far-sightedness of the landowners. We also note that a policy of regional sustained yield management has been made. If properly carried out this policy will assure an adequate supply of timber in the area concerned for generations.

According to Mr. Ernest, forester for the Union Bag Mill, about 1,000 men will be required full time in producing pulp wood and transporting it to the mill. About 1,000 additional employees will be used at the mill, one-half of whom will probably be women, who will assist in the manufacture of the finished products of the mill.

It can therefore readily be seen that the benefits of this, the first paper mill in Georgia, will be far and wide—reaching not only the timberland owners, but the 'Butcher, baker and candle stick maker' as well.

The Georgia Forest Service pledges its cooperation towards the profitable grow-

ing of timber in Georgia by means of adequate fire protection, judicious management and enlarged markets.

C. C. C. Camps—TPO'S And Their Activities

Since the Establishment of the C. C. C. Camps in Georgia

Realizing that the readers of the Review would be interested in the many activities carried on in the various camps and the work being done in their Timber Protective Organizations, we have decided to devote each month in the Review adequate space for their news and progress. In response to requests made to the various camp superintendents and T. P. O. secretaries, the following news items have been received:

Camp P-82, Tar City T. P. O.

With a camp strength of 181 men, 20 of whom are new, P-82 is, at present, working on 65 miles of truck trails in an effort to bring them up to new specifications. We are also constructing 7 1/2 miles of telephone line from Tower 74ES, completed last month, to Beards Creek. This line will, sometime in the future, be connected with Towers in Long and Liberty counties.

The detachment of 45 men, assigned to the Hinesville Side Camp, is completing truck trails and bridges that were left partially completed when the base camp was moved from that area. They also have three timber type crews at work on the Coastal T. P. O. in McIntosh County. We hope to begin the construction of firebreaks and truck trails on this area in the near future.

W. K. PEAGLER,
Project Supt.

Camp P-90, Grand Bay T. P. O.

The enrollment of the camp jumped from 162 to 183 on May 10, when 21 new members were sent to the camp from the Albany recruiting station for conditioning. After two weeks, in which time they are given typhoid inoculation and smallpox vaccination, they will be turned over by the Army to the Using Service for field work.

A 99'9" steel tower has been erected by the camp about four miles from Lakeland, on Georgia Highway No. 11. The tower is completed except for flooring in the cab and steps. This can be installed in a very short length of time when received. Fourteen miles of telephone poles have been set and the wire is now being strung. This line will tie the Lakeland area in with the Homerville area, and the observation towers of each area will be able to spot and give check readings on fires in Lanier, Clinch, Atkinson, Berrien and Lowndes counties.

The recent dry weather has made it possible to work daily on fills and culverts

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on truck trails which were cleared and stumped during the winter and fall, but which, because of too much water, were unable to be completed at the time started.

Camp P-87, Rome, T. P. O.

Now that the hard winter months are behind us, work at P-87 has attained normal progress. The T. P. O. is getting some rather excellent truck trail construction. It is mountain work, and wholly different from South Georgia trails. Bridges and culverts are all of the rubble construction, and the enrollees are proving apt at this work. Some sections of the roadways have to be surfaced with chert, which is abundant in this locality, so that enrollees are getting experience in nearly all phases of road construction.

Another feature of the work that is different from that encountered in South Georgia, is the solid rock encountered in excavation. This necessitates the use of air compressors and drilling, and of dynamite for shooting. Enrollees receive special instructions in the use of explosives, and it is only with extreme caution that they are used.

A lake is located in the middle of the camp site, about an acre in extent. Enrollees have constructed a first class spring board, and swimming proves a pleasant diversion in the afternoons.

It is hoped that the camp strength will be allowed to reach an approximate 200 again. If it does that, considerable work will be accomplished during the current season.

Camp P-68, Coffee-Jeff Davis T. P. O.

Thirty miles of telephone line is being dismantled at Albany, Ga., and transported to Fitzgerald, to be used in the telephone system between Douglas and Fitzgerald via Denton, Ga. This line will serve two lookout towers to be constructed at Denton and four miles west of Pridgen, Ga.

Twenty-one new enrollees have been received into Company No. 1433, bringing the strength up to 192.

This project area has been recently increased by that portion of Bacon County west of U. S. Route No. 1. One lookout tower is now being constructed on this highway, by this camp, two miles north of Alma, Ga.

Grand Bay, T. P. O. Membership Meeting

A membership meeting was held at the Lanier County Court House, on Thursday afternoon, May 14. It was attended by a good many of the members. H. D. Story, District Forester from Albany, Ga., and J. M. Lawton, Project Superintendent of the local C. C. C. Camp were also present. Quite a number of interesting subjects

were discussed, among which was a general outline of the work being done by Mr. Lawton and District Forester, Story. Mr. Story assured us of full co-operation from his office in every way.

After a full discussion of work plans for the coming year, the Nominating Committee reported the following members nominated to the Executive Board for the following year: Messrs. Alex Sessoms, Cogdell; L. L. Patten, Lakeland; W. D. Lee, Ray City; D. O. Johnston, Stockton; Waldo Henderson, Lakeland; T. W. Payne, Valdosta.

MY HOME FORESTRY PROJECT

Winner of Fifth Monthly Prize
Offered by Georgia Forestry Association

Sale City High School Student

EVERETT HIGH

In my study of forestry in our vocational classes I have learned the effect of fire to the forests. After learning the terrible amount of damage done to the forest by fires I could not keep from telling my neighbors, and trying to get them to protect their forests from this disastrous enemy. As a result of my efforts there is quite a different scene in my community this year than last. The trees have a much brighter green color and appear to be more thrifty.

When I approach the farmers of my community to tell them of the damage fire does to the forests they tried to tell me that when they burned the forests there would be more grass. I told them this was not the case at all, but on the contrast there was less grass. It appears to be more grass, due to the fact that the grass shows to a very large extent on top of the black burned ground. Government test have proven that there is not only more grass on unburned areas, but that the grass is more nutritious.

My forestry project consists of twenty-five acres. I have put into practice on these twenty-five acres the principles I have been taught in the class room, by my teacher of vocational agriculture.

I have thinned my project, taking out diseased and deformed trees, established firebreaks where needed, pruned trees that were needing pruning.

My study of forestry in the classroom has taught me many methods to follow in order to have better forests. Unless the timber growers of our state practice better forestry practices as a whole our forests will, in the near future, be completely destroyed.

I would advise that we begin now to protect our forests from fires and follow better forestry practices.

Inspector Gerrard Visits Nursery

U. S. Regional Inspector Paul H. Gerrard visited the South Georgia Nursery on May 4, and his findings are forwarded to State Forester, Elmer E. Dyal. He commends well-advised location of the nursery and the unusually large percentage production of first-grade seedlings to small area planted. There has been a marked increase in the sales of seedlings over the last four years, and a larger production program has been planned to meet the growing demand for stock. The urgent need for more funds was cited; such amounts to be used for immediate erection of more adequate structures and equipment facilities with which to meet these demands. The District Forester has given much time to the nursery, and to his interest and constant supervision much of its growth and success is accredited.

The South Georgia Nursery is located 3 miles from Albany. It is operated by the State Department of Forestry and Geological Development under the supervision of District Forester, Henry David Storey. It consists of 11 1-2 acres, about half of which is seeded in Longleaf, Loblolly and Slash Pine.

The seeds come from all sections of Georgia. They are collected and extracted by C. C. C. enrollees at the various Forest Camps. After cleaning, these seeds are tested for cutting and germination before storing and planting. Planting time is usually between February 15 and March 15, but due to the excessive wet weather and frozen ground both planting and shipping were delayed this year. The developed plants are purchased by private landowners, State Parks, and by the Resettlement Administration, to be used for production, conservation purposes and for beautification. These seedlings are sold positively at cost and with no idea of profit.

Below is shown the comparative production tables for the year 1934-35 and the planned program for 1936.

	1934-35	1936
Loblolly Pine	741,810	300,000
Longleaf Pine	369,275	60,000
Slash Pine	1,547,500	4,500,000
Total	2,658,585	4,860,000

The production increase shown above is approximately the amount of stock for which orders were received last year and which were prorated to applicants. Without the rotation system, it is estimated that the entire acreage of the nursery can produce 10,000,000 seedlings.

Even with this extended program of production, the State Forester foresees a possible shortage and advises all landowners desiring seedlings to forward their orders promptly. The plants can then be shipped when ready.

THE GEORGIA STATE MUSEUM

Reported by THE DIVISION OF GEOLOGY

LANE MITCHELL

A PERSONALLY CONDUCTED TOUR THROUGH GEORGIA STATE MUSEUM

Starting with the cases immediately in front of the State Geologist's office (425) our tour shall progress down the east corridor by the Senate balcony to the north side of the building, thence alongside the classified mineral cases to the northernmost corridor, thence west by the marble columns and meteor to the large display cases in the western corridor to the elevator, thence east to the display of economic geology where we reverse directions and go through booth housing the display of Fluorescent Minerals. Being again beside the elevator, we shall go south past the House of Representatives' balcony to the south end of the building passing by the bird cases to the archaeology and paleontology cases to the southernmost corridor, thence east by the agricultural cases to the east corridor where we go north to the State Geologist's office, the original starting point.

With our direction of travel now decided on and with occasional reference to the floor plan of the State Museum, we should not encounter any trouble in seeing everything in the museum. Let us then get back to our starting point and begin the tour.

The gold case (S. E. No. 6) contains a number of gold nuggets purchased by the State some years ago. These nuggets were found in river beds, either ancient or modern, where they had collected through the centuries after being washed out of the rocks containing them. The nuggets are exactly as found in the stream bed, with surfaces polished and rounded by action of the water. One theory suggests that gold dust might accumulate and become compressed into a larger nugget by the pounding of rocks and gravel but no one knows that this is the case. It seems more likely that large lumps of gold were detached from their original hiding places and carried into the rivers to be polished and rounded. Most gold today is recovered from hard rock mining and the usual quartz gold ores show no free gold to the naked eye. The ore in this case showing little threads and masses of gold is very unusual ore. The gold coins were minted in the United States mint which used to be at Dahlonega.

Back of the gold case is the semi-precious stone case (S. E. No. 5). Here we see the

examples of Georgia stones which can be cut and polished for jewelry. No very valuable stones have been found in Georgia, unless reported finds of diamond and ruby had some truth in them. The gem case shows forms of quartz as rock crystal, smoky quartz, amethyst, rose quartz, rutiled quartz, chatoyant and opalescent quartz, agate, jasper, and opalized wood. Other gem stones displayed are beryl, garnet, moonstone and staurolite. The case also contains specimens of flexible sandstone, lightning-formed sand tubes called fulgurites, and a tiny meteorite. A glass replica of the famous Jonker diamond is also included.

In case (S. E. No. 4) you will see the Pitts' collection of polished stones. Mr. Wm. Pitts, formerly of Georgia, now collects stones from all over the world and cuts and polishes them. His collection in this museum contains petrified wood slabs, beautifully polished slabs of colored stones, and numerous stones cut in gem fashion. Among these are several Georgia stones, the most notable being the red corundum which but for the flaws would be a real ruby.

The next case contains some unusually pretty mineral specimens which have been brought into the State Geologist's office. A complete set-up of one of the small museums furnished by the Division of Geology to high schools and colleges of the State is also in this case.

Next we see a complete collection of tree sections showing the bark and wood of each of the trees native to Georgia. A map attached shows the distribution of the species throughout the State.

An old mantle in the east corridor shows use of Georgia maple and verde antique marble.

In cubicle D is a model of the home of Alexander Stephens, Vice-President of the Confederacy. The home at Crawfordville, Georgia, is now the site of a State Park. On the floor beneath this exhibit are large whale bones found in the Georgia Coastal Plain. At the end of this hallway opposite office 431 are some cases containing mounted butterflies and other entomological specimens. To the west in the hallway running over toward the elevator are several blocks of marble and a case of assorted minerals (N. E. 2, 3, 4). Now let us turn about and face the wall behind us. There hanging on the wall is a beautiful

slab of creole marble, cut from a slab in four pieces and arranged so that the center pattern is symmetrical. Many people imagine seeing the design of a frog or turtle in this piece. At world fairs this slab has won several gold medals.

Now we shall proceed down the east corridor by the mineral cases. The specimens in these cases (N. E. 5 through 12) represent nearly every mineral ever found in the State. The minerals are classified according to chemical composition in the most widely accepted manner called the Dana System which groups minerals as native elements, sulphides, oxides, carbonates, silicates, etc. Our direction of travel makes us view this arrangement in reverse order. To call attention to a few of the mineral specimens, for instance, as we pass by the first case (N. E. 5) we see barite and talc and kindred minerals. The second (N. E. 6) contains the mica, garnet, kyanite, and tourmaline. In the next (N. E. 7) is the asbestos, feldspar and calcite. Then in case N. E. 8 we find the manganese ore, pyrolusite, and the aluminum ore, bauxite, and the iron ores. Case N. E. 9 contains world famous rutile crystals from Graves Mountain and some near gem quality corundum. Amethysts and other quartz types predominate in the next two cases (N. E. 10 and 11). In the last case (N. E. 12) we find pyrite or pyrites, the sulphide of iron which is so commonly mistaken for gold and hence called "fools' gold."

Turning west here along the northernmost corridor we pause at another case (N. E. 13) of sulphide minerals, principally pyrite, and see an instrument included in the case of a type which was fraudulently exploited and sold to the public as a divining rod, an instrument capable of locating precious metals by some magical property claimed for it. As a matter of fact there is no such instrument worthy of faith by the public. Hazel sticks, mineral finding needles, and all other divining rods, "doodle bugs," or water witches are fakes and have no real value to the honest seeker of mineral deposits.

Along the wall of the northernmost corridor are cases containing some of the ore minerals. You will notice that the gold ores are principally iron stained vein quartz and it is doubtful if you can see one particle of gold in all the specimens. Modern refining methods can, however, remove the particles too fine to be seen and concentrate them into larger quantities.

The classical columns standing upright along the center of this hallway are all cut from Georgia marble.

The largest meteor ever found in Georgia comprises exhibit N. W. 13. This meteor is composed of iron and nickel and fell in the vicinity of Social Circle, Georgia. No one saw it fall and it was determined to be a meteor by its nickel content, no earthly alloy containing such a large

quantity of nickel as is present in meteors. The weight of this large meteor is 219 lbs.

Case N. W. 11 contains shells, marls and limestones.

The large upright cases in the west corridor contain exhibits of mineral products. Case N. W. 12 contains fire brick and refractories made from Georgia clays. Case N. W. 9 contains Georgia terra cotta, whereas case N. W. 8 shows use of Georgia kaolin in china ware and paper coating. The next case shows modern aluminum ware as made from the metal extracted from Georgia bauxite.

Cases N. W. 5 and 4 beside the elevators contain clay and odd mineral specimens. The cases in this hallway alongside the wall (N. W. 7 and 10) also contain odd assorted specimens of rocks, minerals and fossils. Case N. W. 4 immediately opposite the elevator also contains several interesting Indian relics and artifacts.

Turning east in the corridor running across the building from the elevators we see a stand containing numerous blocks of stone. These blocks represent most of Georgia's commercial building stones finished in several different ways on the different faces of the cubes.

A petrified tree trunk comprises exhibit N. E. 1. In cubicle C are educational cases, sandstone and granite specimens, and a stuffed alligator.

Here we turn and go through the entrance to the Fluorescent minerals exhibit. Directions for operating this display are painted on the cabinet windows. The ultraviolet rays from the lamp are changed when they strike the minerals in this case into visible light and the rays reaching the eye are of brilliantly colored light. In ordinary light these same minerals have quite a different appearance as can be seen.

Now as we go down the west corridor we see some unusual geologic specimens on top of the storage cabinets. Further along, in case S. W. 1 we see birds of Georgia and (S. W. 4) a possible scene in warm south Georgia.

In the corridor running to the east is a case (S. W. 3) showing eggs of Georgia birds and displaying some of the literature of the Game and Fish Department.

Going south now in the western corridor, we pass by cases (S. W. 5, 6, 7, 8, 9, 10, 11) containing stuffed birds and animals and one (S. W. 10) containing an educational exhibit of rattlesnake bite remedies.

Shells, shark teeth, ancient elephant and horse bones and other fossils from the Coastal Plain of Georgia are found in case S. W. 12.

Arrowheads, Indian artifacts, and Civil War relics are in case S. W. 13.

The next three cases (S. W. 14, 15, 16) contain more rock and fossil specimens. The large corals in case S. W. 15 are skeletons of creatures which once lived in the sea that covered the area now northwest Georgia. The fossil plant in the same case

is of a type that once flourished in a warm humid climate and later was converted into coal such as we burn today. Both of these fossils came from northwest Georgia where remains or casts of creatures and plants that lived in Paleozoic time are found.

The cotton stalk in case S. W. 18 is claimed to contain a record number of bolls. 715 open bolls on this stalk were counted. The specimen came from north Fulton county and was grown in 1912.

Agricultural exhibits and soil specimens are displayed in the large upright cases in the southernmost corridor (S. W. 19 and 20 and S. E. 11 and 12).

Going north in the eastern corridor we pass by cases containing various pictures and specimens of insects and their destructive work.

Opposite office 425 we reach our original starting point. Questions will be gladly answered in the office of the State Geologist.

FROM A GEOLOGIST'S NOTE BOOK

Georgia vermiculite is now being produced for commercial use, it was learned recently. The Jethro Burrell property in Towns County is now being worked and it is locally reported that other properties are under consideration. The vermiculite is a golden colored mica and is an excellent heat and sound insulator after being exfoliated by heat into a light, fluffy mass. The golden color is sometimes utilized in the manufacture of inks and paints.

The large number of deep wells in north Fulton county have shown considerable variation in the depth at which water was obtained. In order to be of service to Georgia citizens planning the expenditure of the large sums of money required for drilling such a well, the Division of Geology is undertaking a survey of all the wells of the area and is collecting all available data on the history of production and adequacy and geology of the formations encountered. Local well drillers are cooperating in this matter by furnishing logs and saving cuttings on wells they drill. Blanks for the logs and sacks for the cuttings are furnished free by the State Geologist to all drillers. Similar information is wanted from all other points in Georgia. The State Geologist will be glad to lend assistance to any driller or property owner in the State in the matter of furnishing all available information. In order to obtain further data, he will furnish log blanks and cutting bags to all Georgia drillers. He urges all possible cooperation from drillers, Georgia citizens, and municipalities planning or drilling or operating such wells.

The articles in the last Review and in this issue on the Georgia State Museum are to be reprinted into an Information Circular available to all parties visiting the museum.

The Georgia Mineral Society has changed its meeting night from the first Monday in every month to the last Monday in the month. The next meeting will be held on June 29th. The next field trip, however, will be held early in June and will be to the Ducktown and Copper Hill areas just north of the Georgia line in Tennessee. P. B. Blakemore, Jr., will lead the excursion. He spoke to the members on the Mineralogy and Geology of the area at the May meeting of the Society.

Approximately 100 sets of Georgia rocks and minerals have been placed in schools of the State by the Division of Geology. Further distribution of these museums is planned after the enthusiastic reception and successful use of the first sets. Assistant State Geologist Lane Mitchell has restocked the bins with the various specimens and John Rauch is at present preparing additional sets for distribution.

Bureau of Mines Publications of Interest to Georgia Mineral Producers

INFORMATION CIRCULARS

- 6879. Sand and gravel excavation, Part 6. Mining methods, by J. R. Thoenen.
- 6881. Trends in white pigment consumption, by Paul M. Tyler.
- 6882. Alums and aluminum sulphate, by John B. Umhau. 32 pp. 1 fig. Describes alums, with their uses and substitutes, reviews history, discusses methods of production, and includes data on imports, exports, tariff history, consumption, markets and prices. Gives list of producers and bibliography. Georgia bauxite is largely used in the manufacture of alum and alum salts.
- 6843. Revised. Prospecting for lode gold, by E. D. Gardner, and Locating claims on the public domain, by Fred W. Johnson. Discusses methods used and equipment needed in prospecting for lode gold, and lists principal laws and regulations pertaining to location of lode claims on public lands.

These publications may be obtained free of charge on application to Information Division, U. S. Bureau of Mines, Washington, D. C.

"Georgia Land Use Problems," by W. A. Hartman and H. H. Wooten is the title of Bulletin 191 of the Georgia Agricultural Experiment Station, Experiment, Georgia. This very interesting and informative book treats of the soil types, the crops, erosion, the forests, the topography and geography, and all other factors affecting the efficient and economic use of Georgia land. Some definite recommendations are made for certain counties. The Bulletin is available at no cost to Georgia citizens upon application to H. P. Stuckey, Director, Experiment, Georgia.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

Vol. 6

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No. 7

VOCATIONAL TEACHERS DO UNUSUALLY FINE WORK IN FORESTRY DURING PAST YEAR

Many Pounds of Seed Collected by Students—Seed Beds Established in Several Schools—Large Number of Seedlings Planted on Home Farms of Students and by Adult Farmers.

Each year the Department of Forestry and Geological Development cooperates with the teachers of vocational agriculture throughout the state in carrying on a forestry program. A summarized report of the forestry work done by the vocational schools is given herewith, which shows an increased interest in this subject for the school year 1935-36 over past years, by both students and teachers.

It is thought with the broader policy of permitting one student from each school in the state where vocational agriculture is taught, instead of one from each county, to attend the vocational forestry camp, interest in the subject of forestry will be still further increased.

Each vocational school in the state has a school forest of ten or more acres, leased to the school for a period of ten years. Demonstrations are conducted on these school forests, which afford an opportunity for the students to practice what they have had taught to them in the classroom. As often as possible, a district forester visits the school and conducts a demonstration with the students of forestry.

The district foresters make management plans for the teachers to carry out. These plans call for specific jobs to be carried on during the school year. Such jobs as are given below are included in the teaching program for the year and are taught at the time of year when most practical:

1. Tree identification.
2. Collecting seed.
3. Forest improvement.
4. Planting and operating seed beds.
5. Fire prevention.
6. Planting young seedlings.
7. Estimating standing timber.
8. Measuring diameter growth.
9. Storage of seed.
10. Construction of firebreaks.

11. Forestry programs with adult farmers.

More than 2,000 "ninety minute" periods were devoted to teaching forestry during the past year, with above 3,000 students studying this subject in the classroom.

Realizing that one way to prevent soil erosion is by planting young seedlings on deforested areas, the teachers in practically every community planted a number of pine seedlings during the year. Approximately 1,000,000 seedlings were grown and planted on home farms of the students. These seedlings were grown in seed beds that had been prepared by the students on the school forests and at home. More than 400 pounds of seed were collected, some of which were used by the students themselves, while the remainder were sold. As a result of the students taking so much interest in reforestation, the adult farmers in the school communities planted approximately one-half million seedlings.

Each forestry student in these vocational schools is required to have a home forestry project. These projects consist of approximately two acres of wooded land on their farm. They are seasonal, local in their interest and development, meet the interest of the people and are planned to be practical. Each student having a home forestry project is required to have a plan of work covering a season more or less extended. This plan is a part of their instruction in forestry. By this method the teacher, pupil and parents have a definite understanding as to the plan of the project.

Realizing that a great work could be done with adults in fostering a good forestry program in the various communities, several teachers held classes with the adult farmers during the year. The discussions with these adults were limited to such practices of farm forestry as the land owners could readily understand and apply.

(Continued on Page 8)

Forestry School Camp To Be Held July 5-15

**Sixth Annual School Camp to be
Held at Abraham Baldwin Col-
lege, Tifton, Georgia**

The sixth annual vocational forestry camp will be held July 5 to 15 at Abraham Baldwin College, Tifton, Georgia. The camp will be held in south Georgia this year in order to give an opportunity to study the forests of south Georgia.

One hundred and twenty-seven students from rural high schools where vocational agriculture is taught will attend the camp. Sixty-four of these students attended the camp which was held at Dahlonga last year. At the end of the camp both groups will receive certificates stating that they have attended and received instruction in certain phases of forestry.

The camp is held each year in order to extend, under practical conditions, the teaching which has been carried on in the agricultural classrooms of the high schools. Instruction in the camp will be conducted by members of the staff of the Department of Forestry and Geological Development, assisted by teachers of vocational agriculture.

The boys attending the camp were selected on the basis of a competitive examination in forestry, their scholastic average and moral character being considered. This method of selection insures getting not only boys who are interested in forestry, but those who have a high standing in their respective communities.

The camp is conducted jointly by the Department of Forestry and Geological Development and the Department of Vocational Education. The expenses of the camp, such as board and lodging, are paid by the Division of Forestry, and the expenses of transporting the students to and from the camp are defrayed by the Department of Vocational Education. George I. Martin, Assistant Supervisor of Agricultural Education, will be camp manager. He will be assisted by a group of teachers of vocational agriculture. The district

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

Forestry Camp

(Continued from Page 1)

foresters of the Division of Forestry will give the instruction.

Such courses as (1) tree identification; (2) forest management, which includes collecting and storing tree seed, growing plant stock, planting young seedlings, fire prevention, firebreak construction, thinning, improvement cutting and estimating standing timber, will be taught.

The students who will attend the camp this year are as follows:

Second Year Student

School	Student
Alma	Vernon Deen
Baldwin	John H. Sanders
Bridgeboro	Ed Brown
Cadwell	Colter Bennett
Chattanooga Val.	K. D. Marshall
Commerce	George Poole
Crawford Co. High	Larton Burnette
Crisp Consol.	Mitchell Moore
Cussetta	Johnnie Gallops
Dacula	William Dalton
Damascus	Marion Pullem
Dawnville	Amos Ray
Dawsonville	Joe Dan Cox
Eastannollee	Guy Davis
Elmodel	Chester Kelly
Epworth	Chas. Kiker
Fairburn	Jas. A. Rainwater
Fort Gaines	Ralph King
Franklin Co. High	Fred Brown
Franklin High	Roy Stephens
Gilmer Co. High	Jim Gudger

Girard High S.	Henry Cochran
Gore	Dorsey Hawkins
Hiltonia	Robert Griner
Ila	Jack Veatch
Irwin Co. High	Wallace Childs
Kite	Logan Cook
Lynwood	Jesse Reeves
Lyons	Edwin Winge
McPhaul Institute	Murray Massey
Mt. Pleasant	Wallace Brock
Mont. Co. High	Arthur Lee McCoy
Morven	Ralph Scruggs
Moultrie	Paul Beck
Murray Co. High	Sam Jones
Nancy Hart Con.	Joe Mann
Oakwood	Lloyd Turk
Pavo	Harold Cooper
Palmer-Stone	Edward Stone
Poplar Spgs. Con.	Leon Singletary
Preston High	Ralph Wiggins
Register	Carroll Dekle
Richland	Philip Turnipseed
Sale City	Allen Crosby
Screven High	J. B. Oliff
Sonoraville	William Bohanan
Soperton	Bill McCrimmon
Southwest DeKalb	Wiley K. Smith
Sparks-Adel	Paul Barrett
Swainsboro	Garland Black
Ty Ty	Ramon Harris
Union High	Ellis Clark
Wadley	Austin Rheney
Wareboro	Chester Roberts
Washington High	Joe Bennett
Wheeler Co. High	Edward Cooper
Winder	Gus Johnson
Winterville	Parks Lanier
Monroe	Madison Smith
Cleveland	Albert Dorsey
Ludowici	Leon Brewer
North Floyd High	Ernest Carney, Jr.
Butler High	Alfred Childres
Hogansville	Edward Johnson

First Year Student

Adrian	Arnold Lloyd
Adairsville	Harold King
Air Line	Jim Higginbotham
Alpharetta	Marion Stroup
Ashton	Norman Dorning
Banks Co. High	Bill Little
Barney	Lloyd Rogers
Bartow	H. G. Harvely
Barwick	Walter Tom Sheffield
Bay Branch	Frank Getsinger
Bluffton	Elton Collins
Bowman	Clower Butler
Brooklet	William Clifton
Bowersville	Dorsey Partain
Centerville	Herbert Mullinax
Centralhatchee	Milton Bell
Center Con.	Bruce Odom
Chamblee	Wilson Dempsey
Clarksville	J. Vern Stancil
Cohutta	George Ed. Seaton
Cotton High	Lester Sullivan
Dixie High	A. J. Powell
Fannin Co. High	W. Y. Vanhook
First Con.	Bailey Jones
Fortsonia	John T. Edwards
Gillis Springs	Pierce Burns

Gordon Institute	J. H. Lee
Good Hope	Buddie Meadows
Graymont-Summit	Virgil Webb
Hartwell High	Leland Ferguson
Hopeful Con.	Thornwell Smith
Jersey	Mahlon Edwards
LaFayette	Orville Pope
Logansville	Alton Langley
Mcland	Guy Brinkley
Mt. Olivet	Billy Alexander
Marvin Yancey	Cecil Hart
Meigs	Walzo Owens
Millen	Archie Rushton
Madison Co. High	Wallace Hardeman
Ocilla	Dick Paulk
Peelham	James Smith
Plains	Frank Williams
Quitmen	Roland Clauton
Rabun Gap	Cline Cragg
Rentz	Robert Barron
Rock Branch	Rufus Burden
Rockingham	Virgil Carter
Rocky Ford	David Keel
Rossville	Alvin Hicks
Sardis Con.	John Frye
Sardis High	Emory Murray
Snellville	Forrace Britt
Stapleton	Lee Audrey McNair
Sumner Con.	James Roberts
Summerville	Sam Sittin
Sylvania	Bruno Pfeiffer
Tignall	Sam Dunaway
University System	Earl Glenn
Union Con.	Jack McDowell
Valley Point	Merdia Corbin
Vidalia	Woodrow Odom
Wrens Institute	Eulie Anderson

Tribute Paid Ivan Allen

Tablet Unveiled and Exercises Held on Fort Mountain

Tribute was paid to Ivan Allen at exercises held on top of Fort Mountain Saturday, June 13. The exercises were held in honor of this distinguished Atlanta who had donated land for Fort Mountain State Park to the state.

This park embodies a tract of 120 acre which was purchased by Mr. Allen and given to the state for the distinct purpose of being developed into a park. Reared in Dalton, Mr. Allen, as a boy, looked out of the schoolroom window at the crest of the mountain which, as a man, he has helped transform into a beautiful and historical park.

On a stone observation tower built by CCC boys in the park, a tablet was unveiled honoring Mr. Allen. A large delegation from Atlanta and all north Georgia attended the exercises.

The program included addresses by Councilman Frank Beck of Atlanta, representing Mayor Key; Mayor Oliver Hardin, Dalton; Mrs. M. E. Judd, Dalton; Chairman State Park Committee; and J. H. Gadsby, Regional officer of the National Park Service.

FIRST DISTRICT**T. P. Hursey, Dist. Forester,
ROME****Fire Demonstrations**

There are three classes of people who realize that forest fires retard the growth of those trees which are not killed in the fire. They are: the people who read reliable literature on such subjects; foresters, technical and otherwise, who have studied the cores taken from large or old trees by an increment borer, and the few that have seen side by side demonstrations.

The first named realizes it, the last two classes are convinced, and the last mentioned class are probably the only ones really impressed. It seems doubtful if we will ever be very convincing in our talks to the laymen of the state until each of us is thoroughly impressed. The term "impressed" is used instead of "convinced" because a convinced person usually accepts a fact and does nothing about it, while an impressed person is ordinarily very enthusiastic.

We need more impressed people in Georgia, and to have them we must have living side by side demonstrations because seeing a fact will thoroughly impress more people than anything else. When this is accomplished, we can have an enthusiastic people who can and will do something about the poor forest practices in Georgia.

Study the picture below and imagine the vast number of people in our state who would be enthusiastic about forest fire prevention if we had demonstrations along the highways leading to the county seats. "Seeing is believing" has often been said and will bear repeating here.

We need three types of side by side demonstrations along the highways of this state, which are as follows: burned vs. unburned, thinned vs. unthinned, and abandoned farm land vs. woodland. If we had no more than one set of three in each county it would be a great help. Land for such demonstrations would probably be given by interested land owners, but it is doubtful if they would buy the seedlings to be used on an experimental forest. Each plot (six in all) should not be less than one acre in extent, and all six would require about 8,000 seedlings. Forestry minded people in this state should get behind such a demonstration program.

There is an effort being made in this district to get such demonstrations located at or near each vocational school to be used in community education. We have the quarter acre plan now, but until we start with seedlings it does not seem that we will ever be very impressive—and we want to impress people more than anything else.

Forestry minded people and district foresters have done volumes of talking and felt that they were not accomplishing anything. Perhaps it is time to let the tree do the talking.

The country wide TPO of Floyd county is not progressing as rapidly as the district forester would like, but it is perhaps better that the people think the matter over, rather than take in all that is said for the face value—it may be the forerunner of a more lasting organization.

Cherokee County TPO reelected their old officers and planned to expand their organization during the summer. They voted to buy blood hounds for the purpose of catching the walking firebugs. This TPO was the most poorly paid up in this district, but has managed to get the best results of any.

The work being done by Camp P-87 is moving along more rapidly now that weather conditions are better, and under the good management of Mr. Simonton and his efficient personnel we are expecting great things in the future.

The district forester met with the leading citizens of Polk county on Monday, June 15, for the purpose of discussing the possibilities of organizing a TPO in that county.

SECOND DISTRICT**W. D. Young, Dist. Forester,
GAINESVILLE****Chicopee Forest to
Be Re-Surveyed**

The Chicopee Manufacturing Corporation near Gainesville, Ga., owns approximately 5,000 acres of land in Hall county embracing a small creek watershed. This area is used for their water supply, and forest management is practiced to gain a complete forest cover over much of the land which was formally farmed.

During the year 1927 a forest survey and management plan was made of the tract by the Georgia Forest Service on a cooperative basis to determine what was needed to eventually bring the area into development. The management plan and recommendations were based on a 5 year program including planting, thinning and fire protection. Plans as recommended have been carried out and less than 10% of the area has been burned over during the entire 5 year period. Due to lack of available planting stock, as supplied by the state nurseries planting, of open areas has been slowed to some extent. As a result of intensive fire protection, much of the area thought at one time in need of planting will not have to be planted. For the past two years planting has gone forward at a much faster rate and in the spring of this year 63,000 loblolly pines were set out with a 98% survival.

(Continued on Next Page)



This picture was taken on the property of Mr. R. I. Denmark, Ausmac, Bainbridge, Georgia.

All four of these trees were transplanted as year old seedlings ten years ago. The two trees on the left were burned around one time six years ago; otherwise they have had the same care.

Measurements:

Burned	Unburned
12 ¼	23 ¼
11 ¼	18 ½
(Cir. 4 ft. from ground)	
Height:	
11 ft	21 ft.

Since 1927 when the survey was made, the Company has added several hundred acres to the tract through purchase and due to partial coverage by the original plan and the fact that it was based on a 5 year program which has been completed, the Company desires a new survey made to include the new purchase and to further

recommend plans for continued development of the original area.

This the Georgia Forest Service plans to do on a cooperative basis as handled in 1927 and steps are being taken to start the survey in August, which will necessitate a complete strip survey, type map and management plan to be projected for the next 5 or 10 years.



Attractive sign erected at entrance of Chicopee Watershed—Gainesville, Ga.

SEVENTH DISTRICT

Russell Franklin, Dist. Forester
Waycross

The Brantley TPO and the Brunswick-Peninsula TPO have consolidated under the name of the Altamaha-Satilla TPO. The charter and by-laws necessary for incorporating this new TPO are in the process of being drawn up. At a meeting held in Nahunta the following officers were elected:

J. T. Adams, Nahunta, President.

P. L. Bernard, Waynesville, Executive Vice-President.

W. L. Harwell, Brunswick, Executive Vice-President.

K. S. Varn, Hoboken, Vice-President.

J. D. B. Paulk, Brunswick, Vice-President.

E. G. Strickland, of Nahunta, will assume the duties of Secretary-Manager with J. E. Lanier, Brunswick, as his assistant.

The acreage now covered by this TPO is approximately 360,000 acres. The TPO now owns 2 Diesel tractors, 4 plows, 1 grader, 2 trucks, and miscellaneous fire-fighting equipment. Individuals and companies in this area own other equipment which will be used to supplement the TPO owned equipment. There are now four towers in this area with one other scheduled for construction in the near future.

Grand Bay T. P. O. Elects Officers

A very important meeting of the directors of the Grand Bay TPO was held in Lakeland, June 3. Those present were A. K. Sessoms, Cogdell; D. O. Johnson, Stockton; Waldo Henderson, Atkinson county; T. W. Paine and Geo. L. Shelton, both of Valdosta, and L. L. Patten of Lakeland. Mr. J. M. Lawson, foreman of the CCC camp works department, was also present.

The following officers were elected to serve for the ensuing year: A. K. Sessoms, president; D. O. Johnson, vice president; H. H. Jones, secretary and treasurer.

By a unanimous vote, W. L. Miller was continued as a director, W. D. Lee, who had been selected to succeed Mr. Miller, having declined to serve for business reasons.

Among the important things discussed at this meeting was a report from Mr. Lawton in which he advised that he was applying for material for erection of fire towers and a complete telephone system for the Lowndes county section.

In preparing a budget for the incoming year, an adequate fire protection system was taken care of, which included the following: Broadcasting system, fire towers and telephones, in addition to truck patrol, all of which, when completed, will give our TPO members the best possible fire pro-

tection. Among other things budgeted, was the erection of an office building to be erected at a site to be selected later.

In view of the installation of part or all of the above equipment, the directors thought it advisable to fix an assessment rate for the incoming year of 3c per acre, to be called for if and when they needed extra money, the present rate of assessment of 1c per acre to continue, however, as long as it furnished sufficient money to meet the current expenses of the TPO.

After the meeting adjourned, they were invited out to the camp of Mr. Reason Henderson, situated on Banks Lake, where the secretary, assisted by Mrs. Jones and Mrs. C. A. Spence, gave an old time fish fry and barbecue. In addition to the directors those present were: Mr. Lawton, Mr. Conine, Mr. Thorp and Mr. Baton, foreman of the local CCC camp and Mr. Gaskins foreman of the side camp at Nashville.

Georgia Leads in Naval Stores Production

**Produces More Than Half of Both
Gum and Turpentine**

Naval stores producers in the United States made 2,276,491 barrels of rosin in the 1935-36 season, almost 50,000 barrel more than the year before, and 602,90 barrels of turpentine. These figures prepared by the U. S. Department of Agriculture include 1,647,000 barrels of gum rosin and 497,000 barrels of gum turpentine.

Total production in the 1934-35 season was 2,229,122 barrels of rosin and 603,09 barrels of turpentine. In that season the producers made 185 more barrels of turpentine than they did last year. Turpentine barrels hold 50 gallons, and barrels of rosin hold approximately 500 pounds gross.

Georgia produced more than half of the gum turpentine collected last season. Production by states was as follows: Georgia, 275,450 barrels; Florida, 141,416; Alabama, 45,637; South Carolina, 16,697; Mississippi, 10,045; Louisiana, 4,733; Texas, 1,066; North Carolina, 956.

Production of gum rosin by states last season was as follows: Georgia, 909,450 barrels; Florida, 466,929; Alabama, 164,450; South Carolina, 53,716; Mississippi, 32,271; Louisiana, 15,311; Texas, 5,650; North Carolina, 3,259.

Details of turpentine and rosin production, distribution and stocks in the United States the last three years, and imports and exports of naval stores the last season are covered in the annual report on naval stores just issued by the Bureau of Chemistry and Soils. Copies may be obtained by writing the Bureau at Washington, D. C.—Naval Stores Review.

Schools Doing Most Outstanding Work in Forestry in 1935-36

Pavo High School Selected to Receive First Prize of \$50—Fairburn to Receive Second Prize of \$25.00 in Cash

Each year the Georgia Forestry Association offers prizes to the two vocational schools doing the most outstanding work in vocational forestry. These prizes are designated "Herty prizes" in honor of Dr. Chas. H. Herty who has done such notable work in the field of chemistry and for the cause of forestry in Georgia.

Pavo High School, with J. D. Davis as teacher, has been selected as the school doing the most outstanding work in forestry during the school year 1935-36. He will be awarded a cash prize of \$50 for this accomplishment. Fairburn High School, R. L. Johnson, teacher, has been selected as the school doing the second best work in forestry in the same period. Mr. Johnson will be awarded a prize of \$25. Both of these prizes will be awarded at the closing exercises of the Vocational Forestry Camp to be held at Abraham Baldwin College July 5 to 15.

Both of these schools have done very fine work in forestry for the past several years, but this year it has surpassed previous records.

Mr. Davis, with his students, has carried out in detail the management plans laid out by the Division of Forestry. He taught vocational forestry to 24 students by the job method, the schedule comprising 15 forestry jobs. During the past year this school planted 1,638 square feet in pine seed. These seed were collected by the students and were planted in seed beds prepared by them, and the seedlings thus grown were used by the students on their home projects. Mr. Davis not only required the student to plant seedlings on their home projects, but was responsible for plantings on a number of farms in the community.

The enterprise that has created the most interest among forestry students and the community as a whole, was the publishing of one issue of the local newspaper by the students on paper furnished to them by Dr. Chas. H. Herty. This paper was made from pines grown in Georgia. This issue of the local paper has attracted the attention of many people and has clearly demonstrated the interest of the Pavo High School students in forestry.

According to the annual report of the forestry work done by the students of Pavo High School, Mr. Davis states that 22 students had seed beds in which pine seed

were planted; four students planted seed beds with hardwood seed. The local chapter of F.F.A. purchased \$6.00 worth of seed and are growing seedlings to sell. They have also planted a plot of 100 feet square in young pine seedlings, gradually decreasing the distance from side to center to demonstrate the proper planting distance.

In carrying out his forestry program Mr. Johnson has taught this subject to 71 vocational students. A great deal of interest in the subjects of forestry has been created by the classroom work with the students and by the work they have done on their home projects.

During the past year 1,500 loblolly pine seedlings, 1,000 longleaf and 500 slash pine seedlings have been planted on the school forest. A large number of seedlings have also been planted by the students on their home farms and by adult farmers in the school territory. Part of these seedlings were grown in seedbeds on the school forest and some were purchased from the state nursery.

The students in this school have taken hikes through the forests for the purpose of studying the different varieties of trees in their community and have collected leaves and specimens of wood for school study.

Fire prevention has been stressed by Mr. Johnson, not only with his students, but with the timber growers of his community. As a result of his efforts during the past year, 60 miles of firebreaks have been constructed.

* * *

In the forestry district where W. D. Young is district forester, with headquarters at Gainesville, the best work was done by Eastanollee. W. L. Green is the teacher who has been responsible for such good forestry work being carried on at this school. A. P. Farrar and Sidney Head are also teachers of vocational agriculture in this school and have assisted Mr. Green materially with the forestry program.

Seventy-four students in this school have studied forestry. Such jobs as preparation of seedbeds, sowing seedbeds, thinning, fire prevention, transplanting seedlings and identification of trees have been taught.

A seedbed 3½ feet wide by 75 feet long was prepared and planted with seed collected by students.

Mr. Green has stressed the planting of pine seedlings as one method of preventing soil erosion. In this he has cooperated with the district forester, and has gotten his students to plant their seedlings on their home projects and reports that approximately 6,500 seedlings have been planted by farmers in the vicinity of his school.

Mr. Green assisted in soliciting membership for a TPO in his community.

Millen High School, E. W. Graham, teacher of vocational agriculture, has a very high record for forestry work during the past school year. A piece of work revealing considerable initiative on the part of Mr. Graham is that he succeeded in getting farmers in his community to plant 50,000 pine seedlings. His forestry students also planted seedlings on their home forestry projects.

A seedbed was established on the school forestry by the students, assisted by Mr. Graham, in order to have more seedlings to plant on school and home forestry projects. Twenty-four in this school studied forestry jobs, such as: preparing seedbeds; planting; setting out young seedlings; thinning; fire prevention and firebreak construction.

* * *

In forestry district four, the school that did the best work in forestry during the past school year was Union High School, Leslie, Ga., Otis O. McIntosh, teacher.

Twenty-four students were enrolled in the forestry class, and under the guidance of Mr. McIntosh, seedbeds were established on the school forest for which seed were collected by the students. Several hundred seedlings were transplanted to the school forest by students.

Mr. McIntosh conducted classes with adult farmers in the community discussing with them topics of interest to the farmers and practices that could be applied on their own farms.

In addition a forestry exhibit was prepared and placed at the county fair, on the subject "To Conserve Our Forests and Forest Products." This exhibit attracted much attention and was of great value in making the people "forestry minded."

Logs have been cut and placed on the school forest for the erection of a log cabin for use of forestry students and the FFA chapter.

Essays were written by the students on conservation, reforestation and the perpetuation of the forests of our state, and the part our forests play in the control of erosion.

* * *

Adrian High School was selected as the first ranking school in the sixth forestry district. O. L. Hayden is the vocational teacher and has done excellent work in forestry for the past several years.

Several thousand pine seedlings were planted by students of this school during the school year in an effort to reforest land that was not adapted to other crops.

Mr. Hayden had 29 students enrolled in his forestry classes. These students collected tree seed, planted seed beds and transplanted seedlings on school and home projects.

A forestry exhibit, built around the idea
(Continued on Next Page)

of protecting our forests and planting land not adopted to raising cotton, corn, etc., to trees, was arranged by the students and teacher and displayed at the school in order to attract the attention of visitors to the school.

A log cabin is being constructed on the school forest for use by the students as a place to study and for social gatherings.

* * *

In the seventh forestry district of the state, in the extreme southeastern section, excellent work in forestry has been done by Waresboro High School. Thirty students are enrolled in the forestry classes studying such jobs as preparing and operating seedbeds, transplanting young seedlings, observing insects and diseases that attack trees, turpentineing, etc.

C. P. Hamilton, teacher of vocational agriculture in this school, is to be congratulated on the fine work he has done not only with his students but with the adults in his community. As a result of his efforts more than 40,000 seedlings have been planted by adult farmers, and several hundred by students on their home projects.

This is the only school in the state reporting that every student studying forestry has a home project in forestry.

Mr. Hamilton has given publicity to his forestry program by writing news articles from time to time for his local newspaper.

Negro Vocational Schools Doing Best Work in Forestry During Last Year

Teachers and Students in These Schools Show Much Interest

The Georgia Forestry Association offered a cash prize of \$15 to the negro vocational teacher doing the best work in vocational forestry during the past school year, and a cash prize of \$10 to the negro teacher doing the next best work in forestry.

There were 45 rural negro schools in the state that taught vocational agriculture during the year. Practically every one of these schools included forestry in their teaching program. After summarizing the year's work of these schools in forestry, the teacher selected as having had the best forestry program is D. F. Morrison at Rosendwald Industrial School, Screven, Ga.

Professor Morrison had 15 students enrolled in his forestry classes, devoting 2 "ninety-minute" periods each week to this subject. Seed were collected by his students which were planted in a seedbed, to grow seedlings to plant on their school forest. The students in this school had home projects in forestry, where they practiced what they learned in the classroom.

Professor Morrison not only did good work with the students enrolled in his

school, but also with the adult negroes of his community, discussing with them topics in forestry that they could understand and apply on their home farms.

* * *

C. L. Ellison, negro teacher of vocational agriculture in Treutlen County Training School, Soperton, Ga., was selected as the negro teacher of vocational agriculture doing the second best work in forestry. To him will go the cash prize of \$10 for his accomplishments. Twelve students were enrolled in his forestry classes, receiving instruction in such jobs as: selecting land to plant in pines, procuring seed to plant, preparing and planting a seedbed, thinning, fire prevention, uses of woods, firebreak construction, etc.

Professor Ellison was responsible for the planting of a large number of seedlings in his community and the establishing of several miles of firebreaks. Classes with adult farmers were conducted, along with his regular evening class work, and much interest was manifested in forestry by those who attended these classes.

An interesting forestry exhibit was prepared by Prof. Ellison and his forestry students, which attracted considerable attention.

Study of Georgia Water To Be Sought

Meeting Held in Albany to Plan for This Study

A meeting was held in Albany, Georgia, recently to make definite plans for a study of the water resources of Georgia. The Georgia Secretaries' Association of Chambers of Commerce is cooperating with the Georgia Forestry Association in making this study.

Walter Brown, Secretary of the Albany Chamber of Commerce, has announced the division of the state into twelve districts and the appointment of a chairman for each district.

The districts and their chairmen are: Albany District, Walter Brown; Columbus District, Walter Pike; Americus District, Miss Mary Walker; Macon District, E. T. Flanders; Waycross District, Miss Leona Bradford; Brunswick District, Richard C. Job; Savannah District, Thomas R. Jones; Augusta District, L. S. Moody; Athens District, Joel Weir; Atlanta District, Frank K. Shaw; Rome District, Wyatt Foster; Dublin District, L. D. Wood.

These secretaries will work individually in their districts and jointly as members of the industrial and municipal water survey committee. It is imperative, said Mr. Brown, that the sum of \$10,000 be raised by September 1, in order to obtain the cooperation of the Federal Government, which will match state money.

Organization of the industrial and mu-

nicipal water survey committee was effected at the joint meeting of the Secretaries' and Forestry Associations, at which time officers were chosen. Guy Woolford of Atlanta, president of the Forestry Association was named chairman and treasurer; Frank Shaw, secretary of the Industrial Bureau of the Atlanta Chamber of Commerce, was made committee secretary. In addition to the district chairmen named above, other members of the committee are: Richard W. Smith and W. R. Ulrich of Atlanta.

Improvement Cuttings As a Great Help

Timber Growers Should Follow Advice of Southern Pine Association in Order to Have Better Forests

Many methods have been suggested by which southern forests may be improved. The Department of Conservation of the Southern Pine Association has suggested that timber growers, whether large or small, follow better practices as to the thinning of their forests. In a recent issue of notes sent out by them they state that:

"Second growth Southern Pine forest will be more profitable, in the long run, if a well-balanced growing stock of thrifty desirable trees, ranging from seedlings to mature timber, is maintained for the purpose of producing continuous growth of maximum value.

Improvement cuttings are harvest or thinning operations made for the primary purpose of encouraging future growth and developing a more productive stand of growing timber. They may often be used to advantage, both in under-stocked (depleted) stands and in over-stocked (crowded) stands.

In UNDER-STOCKED STANDS: a sound trees of desirable species and good form should be reserved. Only those trees should be cut that are:

- (1) Defective from rot and might infect sound trees;
- (2) Injured and may not live until the next cutting;
- (3) Unproductive and of low quality class of less desirable species occupying space needed for desirable young growth.

In OVER-STOCKED STANDS: the best trees, properly spaced, should be reserved. Surplus trees which are interfering with the growth of the best trees should be removed. Usually they will include those trees that are: limby, unthrifty, and of less desirable species, the cutting of which will result in faster growth of more desirable trees nearby.

Water Georgia's Unknown Natural Resource

Reported by THE DIVISION OF GEOLOGY

RICHARD W. SMITH

Do you know that Georgia's largest natural resource and the one about which she knows least is the water supply in her streams and under the ground? We know the location of our streams but we have made practically no measurements of the quantity of water that they carry in flood time or in dry time or of the chemical purity of that water. Are these measurements important? They decidedly are if Georgia is to make the industrial progress to which she is entitled. Every state in the Southeast except Georgia has recognized the need for these FACTS on stream flow and is collecting them year in and year out.

A recent cartoon in Collier's Magazine showed engineers busily constructing a large dam in a dry valley in the West. In the foreground two natives are saying: "Maybe we ought to tell them that's just a mirage they saw." Georgia has for years been trying to get industries into the State with promises of "plenty of water" that in some cases were but little better than a mirage in the desert. Any industry or municipality intending to use a stream as a water supply must have FACTS as to the average, minimum, and maximum volume of water they can depend on. A classic example of the value of the stream flow records to a State is the experience of the Aluminum Company of America in locating its large plants in the Southeast. Some thirty or more years ago when the Aluminum Company first came into this section they examined several possible plant sites in the mountains of North Carolina and Georgia. When they inquired for the stream flow records that were necessary to plan their large hydro-electric power plants they found that no records had been collected in these states, but that Tennessee had been collecting such records for a number of years. Their main plant was therefore built near Maryville, Tennessee. The state of North Carolina immediately saw its mistake and began an extensive stream gaging campaign that is still going on today, and some of the more recent power plants of the Aluminum Company have been located in North Carolina on the basis of these records.

How Records of Stream Flow are Obtained

The measurement of the flow of streams is a function of the Water Resources Branch of the United States Geological Survey. Except for a few gaging stations maintained on the larger navigable streams for the purpose of predicting floods or for

the regulation of inter-state hydro-electric power, this work is done only in states that cooperate by paying at least half of the expense.

The engineers of the U. S. Geological Survey obtain records of stream flow by maintaining gaging stations at certain places on the rivers, where records of stage, or height of water, and discharge, or quantity and rate of movement, are obtained by the use of various types of measuring equipment.

Records of stage on rivers that rise and fall slowly are usually read by a local ob-

server from a staff gage. The simplest form of staff gage consists of a scale graduated to feet and hundredths set vertically where it will be in the water at all stages. The observer reads the height of the surface of the water on this gage once, twice, or oftener each day. Where there is no local observer or where the river is "flashy," rising and falling quickly after showers, it is necessary to install an automatic water-stage recorder that continuously records on paper the height of the water.

To rate a station for all stages may take years. Floods may come at night or at times when the engineer is not at the sta-



"Maybe we ought to tell them that's just a mirage they saw."

Photo—Courtesy Collier's Magazine.

server from a staff gage. The simplest form of staff gage consists of a scale graduated to feet and hundredths set vertically where it will be in the water at all stages. The observer reads the height of the surface of the water on this gage once, twice, or oftener each day. Where there is no local observer or where the river is "flashy," rising and falling quickly after showers, it is necessary to install an automatic water-stage recorder that continuously records on paper the height of the water.

To determine the discharge of the stream an engineer must visit the gaging station and measure the area of the cross section of the flowing water and the velocity of the water at different stages from the lowest to the highest. Where there is a

tion. It is sometimes necessary to wait a long time for a certain critical stage to be repeated, but by a system of telegraph and telephone reports from its observers the Survey endeavors to keep posted on the river's behavior, so that an engineer can be sent to the station in time to get the information. A single measurement of discharge may take from half an hour to day or more, depending upon the size of the stream and the working conditions.

The chemical quality of the water is determined by taking samples at the gaging stations during various stages of the water throughout the year and analyzing them for turbidity or suspended matter and for the dissolved mineral matter. This sampling does not need to be continued over a

long period of years as is the case with the stream flow measurements.

Uses of Stream-flow Records

Industrial Water Supplies: Water for industrial processes is needed in large quantities, and for some uses it must meet specific requirements of composition. The chemical character varies with the origin of the water and the volume of the stream. Analyses may show that a sample of water taken from a stream at one stage may be widely different from a sample taken at another stage. Stream discharge varies all the time, and a continuous record of flow is necessary in order that the analyses may not be misleading.

We now know, thanks to Dr. Herty's experiments, that excellent white newsprint and book papers and rayon can be manufactured from cheap southern pine and gum of only a few years' growth. The next ten or fifteen years will see the establishment of a number of large paper mills, first on the coast and then inland. Dr. Herty states: "The paper mills will come to areas where there is pulp wood and the right kind of water in sufficient quantities, and the supply of water is just as important as the supply of pulp wood. The timber cruises made by the U. S. Forest Service under Captain Eldridge will give us definite figures of our supply of pulp wood in the various sections of the State. But if Georgia does not wish to lose these mills to her sister states she must start at once the all important work of gaging the flow of her streams and analyzing the water."

Water for use in boilers of industrial plants should have certain qualities to prevent scale or erosion. Condenser water for steam plants is needed in large quantities, and its temperature and quality must be known. Temperature, chemical quality, and turbidity are all influenced by changes in the volume of water flowing.

Municipal Water Supplies: The water supplies of most of the larger cities and towns in Georgia come from surface streams. Well water, except in parts of the Coastal Plain, is limited in quantity, and heavy draft may deplete the under-ground supply, preventing further extension of its use. Griffin a few years ago abandoned its wells and went to the Flint River for its water supply. Several other Georgia cities will in the next few years have to charge from deep wells to surface streams, and unless they have stream flow records over a number of years they may make the same mistake made a few years ago by the city of Durham, North Carolina. Durham considered two possible streams, Flat River and Eno River, on neither of which had stream flow measurements been made. On the basis of local testimony they chose Flat River and built an impounding reservoir on it. Subsequent stream-flow records showed that the estimated estimate of the flow of the river were entirely too large, but that the low-water flow of the Eno River was five times that of Flat River.

Even certain cities in the Coastal Plain of Georgia that now apparently have an adequate supply of water from artesian wells will in future years find that although their demand for water is increasing, the yield from their artesian wells is decreasing, or that the wells are being ruined by encroaching salt water. They will then suddenly want years of records of the flow of their nearest surface stream.

Stream Pollution: As cities grow and industries increase, the disposal of waste becomes a problem. The quantity of flow of streams must be known in order to regulate the treatment of sewage and industrial waste so that the diluted effluent will not be injurious to life. Pollution of streams may make the water unfit for human consumption and thus necessitate expensive treatment. The paper mills that we hope to get in Georgia must know the stage of the stream they are on at which there will be sufficient volume of water to make it safe to discharge their waste products into the stream. Eventually all states will have laws regulating stream pollution, and the basis of this regulation will be stream-flow records.

Bridges and Highways: Bridges and highway approaches to them are constructed with the expectation that storm waters will pass without interrupting traffic or backing up so as to cause injury to property. If a bridge opening is too small it will not pass the required amount of water, and as a result the bridge and approach fills may wash out or property upstream may be damaged by backwater. If the bridge opening is unnecessarily large, money has been wasted in its construction. The Georgia Highway Department, lacking stream-flow records, has been forced to guess the volume of flood water that must be allowed for in building its bridges. They have usually played safe by building the openings larger than was necessary, but in bad floods of a few years ago several expensive bridges and fills washed out because the openings were too small. The loss of money in replacing these bridges was much larger than would have been the cost of maintaining gaging stations on these streams for several years.

Other Uses: Stream flow records over many years are equally necessary to intelligently plan flood control projects, for building hydro-electric power plants, for controlling soil erosion, for planning drainage canals, for maintaining uninterrupted navigation on our larger streams, and for the adjudication of inter-state water rights.

The Plan in Georgia

The United States Geological Survey is prepared to cooperate with the State in obtaining and publishing the records of stream flow so vital to growth and progress. The Survey has a trained personnel and has the most modern instruments and equipment for the purpose. Every dollar that Georgia appropriates for this purpose

will be matched by an equal dollar of Federal money.

At present the United States Geological Survey is operating for Federal purpose: 16 gaging stations in Georgia or on its broader streams and these will be maintained without State cooperation. Station have been maintained in the past at 20 other places in the State where it is highly desirable that these stations should be re-established. For a general survey of the streams at least 19 more stations are needed in addition to those stations now in operation and to those that should be re-established. This will require an appropriation by the State of at least \$10,000 per year over a period of several years. Another \$5,000 per year State appropriation will be necessary to collect and analyze samples of water at regular intervals for a year or two at each station in order to find out the chemical quality of the water of our streams.

Under existing law cooperation may be arranged by agreement between the Director of the Geological Survey and the cooperating State organization. The scope of the investigations and the areas to be studied are determined by mutual agreement between the representatives of the Survey and the cooperating State officials. The Survey retains direct supervision of the investigations and of the preparation of the data for publication. It publishes the stream-flow records in its annual water supply papers. If Georgia appropriates at least \$10,000 for stream gaging work the Survey will locate a District Office in Atlanta to handle the work in Georgia.

The Georgia Forestry Association and the Georgia Chamber of Commerce Secretaries have realized the great need for this water survey in Georgia and are working for an adequate appropriation from the State Legislature. Every Georgian should inform his local State Representative and Senator of the vital need for this appropriation.

Work of Vocational Teachers

(Continued from Page 1)

During the year 25 teachers placed forestry exhibits in community or school fairs. As another means of telling the public of the work that is being done in forestry, more than 1,500 column inches were written in local newspapers.

Fire protection being one of the most important means of producing good timber, the teachers of vocational agriculture cooperated with other agencies in promoting further protective organizations. Several teachers reported that they had assisted in "signing up" acreage for these organizations.

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VOCATIONAL FORESTRY SCHOOL CAMP CLOSES SIXTH ANNUAL SESSION JULY 14

Students Represent 120 Vocational Agricultural Schools — Prizes Are Awarded Teachers by Georgia Forestry Association — Senator George Addresses Student Body at Closing Exercises.

The sixth annual Vocational Forestry School Camp was held at Abraham Baldwin College, Tifton, Georgia, for a ten day period, July 5-15.

One hundred twenty students, the largest number ever to attend, representing 120 schools throughout the state where vocational agriculture is taught, were enrolled in the camp. The students were selected on the basis of a competitive examination in forestry, moral character and scholarship also being considered. This method insured getting a high type of student.

Such courses as tree identification, utilization of wood, surveying and mensuration, and forest management were studied. Instruction during the school-camp was given by the following district foresters: W. D. Young, T. P. Hursey, W. G. Wallace, R. R. Evans, S. L. McCrary and H. D. Story, Jr. W. S. Black, teacher of forestry at Abraham Baldwin College, also assisted with the instruction.

The camp was in charge of Geo. I. Martin, Assistant Supervisor for Vocational Agriculture. He was assisted by a group of teachers of vocational agriculture of the state.

A good recreational program was provided for the students, which consisted of swimming, soft ball, baseball, boxing and horseshoe pitching. This program was in charge of G. P. Donaldson, Dean of Abraham Baldwin College. He was assisted very ably by Leroy C. Lanford, teacher at Abraham Baldwin College. There was a great deal of interest shown in the recreational program and keen rivalry between the first and second year groups, and between the students from North Georgia and those from South Georgia.

Each evening the students assembled in the college auditorium for a short program of songs, motion pictures and talks along forestry lines by invited speakers. The speakers who were invited and appeared on the program from time to time included:

Richard W. Smith, State Geologist, Atlanta; G. D. Markworth, Director School of Forestry, Athens; Paul H. Gerrard, U. S. Forest Service, Atlanta; L. M. Sheffer, State Supervisor of Vocational Agriculture, Athens; John Green Herring, Editor Tifton Daily Gazette, Tifton; E. C. Starr, Director, Coastal Plain Experiment Station, Tifton; and Senator Walter F. George, Vienna.

The entire student body was taken on a pleasure trip to Sea Island Beach on Saturday, July 11. This was a real treat, for many of them had never seen the ocean. After enjoying the surf for several hours, they returned to camp to rest and recuperate from the effects of the hot sun and the long journey.

The following students were elected officers of the two groups: First Year Group—William Clifton, Statesboro, president; Walzo Owen, Pelham, vice-president; Thornwell Smith, Camilla, secretary.

Second Year Group—Edward Stone, Oxford, president; Edwin Winge, Lyons, vice-president; Albert Dorsey, Cleveland, secretary.

The following ten students from each group made the highest grades during the camp:

First year group: Lamar Hammond, Good Hope; Robert Davis, Franklin; Bob Tuten, Alamo; Thornwell Smith, Hopeful Consolidated, Camilla; Earl Glenn, University System, Athens; Cline Cragg, Rabun Gap Community School; Frank Williams, Plains; Bruno Pfeiffer, Sylvania; Guy Brinkley, Macland Consolidated, Powder Springs; James Roberts, Sumner High.

Second year group: Amos Ray, Dawnville High, Dalton; William Walton, Dacula; Albert Dorsey, Cleveland; Wallace Childs, Mystic High; Wiley K. Smith, Southwest DeKalb, Decatur; Jim Gudger, Ellijay; Jesse Reeves, Lynwood; Sam Jones, Chatsworth; Austin Rheney, Wadley; Harold Cooper, Pavo.

(Continued on Page 3)

GUM NAVAL STORES DEMAND THIS YEAR WELL SUSTAINED

Domestic Sales Serve to Offset Lessened European Buying — In Government Assistance

(By J. C. Nash, President, Columbia Naval Stores Co., in special chemical edition of the New York Journal of Commerce).

When one mentions naval stores outside of the Southeastern ports of the United States he should be careful to see that his readers know what is really meant and that he is not discussing the navy nor ship-chandlery but simply rosin and turpentine. Formerly the term, "naval stores" denoted tar and pitch used for calking naval vessels.

For the past two years the industry has been involved with governmental experiments intended to help the producer. Unfortunately the net result except for a short period has not aided the producer. During 1935 and 1936 government loans were made with temporary price benefit to the producer but with a subsequently lower market and the retention at the present time by the Commodity Credit Corporation of a tremendous percentage of the present visible supply.

Strenuous efforts have been made this spring to secure further Government assistance and the sentiment of the industry about such further assistance is divided. Some producers are most anxious to secure it. Others think a more wholesome status would be maintained if the industry should be permitted to go ahead and work out its own salvation. I should say at the present time there is about an equal division of sentiment but a trend toward the latter school of thought.

CROP OUTLOOK

The present crop outlook for the year 1936-37 is for an increased crop, which has up to this time been estimated at about 15 per cent, or roughly 585,000 barrels of turpentine, against approximately 510,000 barrels for the year ended last March 31.

(Continued on Page 3)

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NAVAL STORES OPERATORS HOLD MEETING AT VALDOSTA JULY 8

Timber Conservation and Crop Reduction Program of Federal Government Explained

The large gathering of naval stores producers at Valdosta on Wednesday, July 8th, most of whom were members of the American Turpentine Farmers Association, enthusiastically received the forest conservation program which was formally and officially offered to them by an official of the Agricultural Adjustment Administration, Mr. Jay Ward, who is well known to the naval stores industry.

The acceptance of the program, as explained in an informational leaflet and outlined by Mr. Ward, was unanimous.

While the plan presented means a certain reduction in production to the naval stores producer, for which cash benefits will be paid, at the same time it is known as a forest conservation measure coming under the Soil Conservation Act, by virtue of building up the soil through a discontinuance of turpentine operations on a certain percentage of the trees now being worked, it being proven that trees undergoing turpentine operations require more nourishment from the soil than idle trees.

LARGE INCREASE IN PRIVATE FIRE PROTECTION FUNDS

Southern Pine Forestry Notes.

The Clarke-McNary Law, enacted by congress in 1924, makes provision for federal cooperation with the States and private owners in forest fire protection. All Southern states accept this cooperation which constitutes a grant of federal funds to each State for fire protection purposes. The amount so granted each State cannot exceed the combined total of State and private funds spent for approved fire protection.

That private forest owners are voluntarily bearing a large proportion of the cost of cooperative fire protection in the Southern states is shown in the following table prepared from data supplied by the U. S. Forest Service.

Budgeted Funds Under Sec. 2 of Clarke-McNary Law for the Southern States (1)

Fiscal Year ending June 30th	FEDERAL		STATE & COUNTY		PRIVATE		TOTAL	
	Amount	%	Amount	%	Amount	%	Amount	%
1934	\$327,367	44	\$249,458	33½	\$168,603	22½	\$745,428	100
1935	396,365	41½	323,376	34	235,065	24½	954,806	100
1936	434,885	33	481,501	36½	401,186	30½	1,317,573	100

Increase 1936 over

1934	107,518	33	232,043	93	232,583	138	572,144	7
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(1) Ala., Ark., Fla., Ga., La., Miss., N. C., Okla., S. C., and Tex.

PROGRAM TO STABILIZE NAVAL INDUSTRY ANNOUNCED

A program to stabilize the naval stores industry by paying operators to curtail production and to promote forest conservation has been announced by Joseph C. Kircher, Southern Regional Forester, headquartered in Atlanta.

Mr. Kircher said authorization for the program was received from the Secretary of Agriculture after a meeting in Washington at which Robert M. Newton of Wiggins, Mississippi, represented the American Turpentine Farmers Association.

Cooperation on the part of producers will be entirely voluntary, Mr. Kircher said. A meeting of Forest Service officials and representatives of the industry was held at Valdosta on July 8. Similar meetings are scheduled for Savannah, Georgia, Jacksonville, Florida, and Pensacola, Florida.

J. Ward, Washington, D. C., and C. F. Evans, Atlanta, Georgia, represented the Forest Service at the Valdosta meeting. The industry was represented by R. M. Newton, H. Langdale, Valdosta, Georgia, and C. P. Kelly, Madison, Florida, executives of the American Turpentine Farmers Association.

The program is simple. Producers desiring to cooperate will cease chipping on

It will be noted from the table that since the fiscal year 1934, the total spent for cooperative fire protection has increased by over half a million dollars, or 77 percent. State and county funds have increased by 93 percent, private funds by 138 percent, and federal funds by 33 percent. It is shown, also, that federal participation in co-operative fire protection has decreased from 44 percent in 1934 to 33 percent in 1936; while state and county participation has increased from 33½ to 36½ percent and private participation from 22½ to 30½ percent. The total shown as private does not include all private expenditures, as the protection costs of many owners do not qualify for cooperative purposes.

All agencies concerned in protecting forests against fires should expand their contributions as rapidly as possible to enlarge the area under protection and increase its effectiveness. That private forest owners will cooperate voluntarily is evident from the record.

25 per cent of the faces on or before July 11 and will remove the cups on or before August 1. The cups to be removed must be in solid blocks; otherwise government checkers will be unable to inspect and report on the reduction that has been made.

Operators and factorage houses will be furnished with "work sheet" forms on which to report the reductions. These forms will be submitted to the Regional Forester of the United States at Atlanta, Georgia.

The new program will be administered for the Forest Service by three supervisors John M. Tinker at Savannah, Georgia; T. N. Busch, Jacksonville, Florida, and Joseph Yencso, Pensacola, Florida. These men will have charge of a number of inspectors and checkers who have already been selected and are being assigned to specified counties for the purpose of reporting on the discontinuance of naval stores operations.

Compliance payments will be made after November 1 to producers who carry out the approved practice relative to trees which are now currently being worked. The rates will be as follows: For faces 66 inches or less in height, 4 cents a face; for faces more than 66 inches in height, 2½ cents a face. Measurements will be taken vertically between lowest point of wound face (first wound of virgin face) and highest point of wound (shoulder side of streak).

SECOND ANNIVERSARY SOUTHERN REGION UNITED STATES FOREST SERVICE JULY 1

Important Strides in Forestry Conservation Shown in Report of Regional Forester Jos. C. Kircher

We wish to congratulate the Southern Region of the U. S. Forest Service on the important strides made in forest conservation, as shown by the report of Regional Forester, Joseph C. Kircher to F. A. Silcox, Chief Forester of the United States.

During the past two years many thousand acres of land unsuited to agriculture uses were acquired and set apart for forest improvement, also nurseries were established to raise seedlings to be used in reforestation work in the South.

During this period the boundaries of the National forests in Georgia and other southern states have been realigned giving Georgia, North Carolina and Tennessee National forests exclusively their own. This readjustment of boundaries on state lines is considered an important administrative step because it will simplify the job of protecting and developing these areas and strengthen the economic importance of the forest lands to the states in which they lie.

Mr. Kircher, in his report, praises the work of the CCC camps very highly. He states that:

"Our CCC camps, of which we now have

230, continued to render excellent public service in working over thousands of acres of forest land to improve the stands of timber and prevent and check attacks by tree diseases and insect pests. They also constructed truck trails, built fire towers, planted millions of trees, improved raw and eroded road banks, and carried on projects to check general erosion. These camps have become economic fixtures in countless Southern communities and not only render practical public service as every-day routine, but are constantly called on by the State and local authorities in cases of emergency such as the Gainesville and Tupelo tornado disasters which shocked the Nation in April.

"I consider the CCC work to prevent and suppress forest fires one of its most valuable services to the South, where we have a terrific fire problem. Average annual damage to forest lands have been estimated at more than 15,000,000 dollars. I am happy to report that the work of the CCC is gradually cutting down this loss. It is difficult to estimate the exact reduction but all forestry authorities agree that excellent results are being achieved. The amount of privately owned and state owned forest land receiving organized protection from fire increased during the past year from 40,000,000 acres to 65,000,000. This is an extremely important step in southern forest conservation."

GUM NAVAL STORES HAS BEEN WELL SUSTAINED

(Continued from Page 1)

Recent severe drouth in the South may cause this estimate to be revised downward. (The crop is now estimated at 525,000 to 540,000 barrels). It will take a few weeks to make this clear. Fortunately the outlook for consumption in this country during the present year is extremely good and I think it is safe to say that there has been the best spring business for turpentine in America that we have had since 1929.

There is also the maintenance of a good demand for rosin in this country and this satisfactory condition in America will go far to offset the lesser European demand which is adversely affected by the continued difficulties of financing in Continental Europe and the consequent great economy in the use of products to be imported.

Those interested in rosin should not forget its cheapness as compared to practically every article with which it comes into competition. This refers to other gums, both natural and synthetic, for varnish making purposes; and to oils and fats in soap manufacturing. Besides, there is a steadily improving statistical position with considerably less on hand in America than there was a year ago.

QUALITIES IMPROVED

In recent years there has been continued improvement not only in the quality of gum rosin produced but also in the package containing rosin, and the gum industry which used to be harassed by claims for seepage of moisture through practically open heads of barrels and driving a spike into the solid body of the rosin.

In the matter of improvement in production methods an increasingly satisfactory service is being rendered by the department of Agriculture through forest experiments at Lake City, Fla., where tests of all kinds both as to physical handling in the woods and actual treatment of gum after it is collected are made.

I have mentioned these improvements in production methods at the end of this article for the reason that it is increasingly apparent that the greatest possible technical improvements must be brought about by the gum industry and the most modern methods must be employed in order to produce in quantity at the lowest possible price for competition with wood products and with synthetic rosins. I should say that progress has commenced in this direction and may be expected to continue.

NAVAL STORES (Continued)

The territory embraced in the naval stores belt extends from North Carolina, where turpentine farming began during the past century, to Texas, where the industry is comparatively new. Because there is a larger percentage of young trees suitable for naval stores in Georgia than in any other state, there are approximately 629 of the entire 1100 processors operating in South Georgia, while the gum producers without stills number approximately 9,000 of the 11,280 in the naval stores belt. For this reason, it has been necessary to divide South Georgia, for administrative purposes, between the offices to be located at Jacksonville, Savannah, and Pensacola.

VOCATIONAL SCHOOL CAMP

(Continued from Page 1)

Senator Walter F. George was the principal speaker at the closing exercises held on July 14. He congratulated the students on their interest in the subject of forestry, and urged that they continue this interest in order that our great forest resources might be better protected and more fully developed.

J. D. Davis, teacher of vocational agriculture, Pavo High School, was awarded a cash prize of \$50 and a Certificate of Honor, given by the Georgia Forestry Association in recognition of the most outstanding work done in forestry during the past year. R. L. Johnson, teacher of vocational agriculture at Fairburn was awarded a second prize of \$25. These two teachers have carried on excellent forestry programs in their schools for several years and are highly commended for their accomplishments.

The camp pianist was Miss Lurline Nance of Sylvester, and Miss Elsie Edwards was camp secretary.

THIRD DISTRICT

Stewart L. McCrary, District
Forester, Augusta

Middle Georgia T. P. O.—Almost no fires reported since March. The manager of this TPO is spending the summer months signing up new acreage and using every effort to build up the organization. The timberland owners in Twiggs and Wilkerson counties are becoming more and more forest minded, however, and we hope soon to have many acres added to this TPO.

Greene County T. P. O.—This TPO will reorganize in September and it is hoped will have a large organization perfected this winter. Many are asking about seedlings in this county, and hope to plant a considerable number of slash pine seedlings there during the winter.

SUPPLY OF SEEDLINGS AT STATE NURSERY GOING FAST

Prices Given—Buyers Urged to Place Orders Early.

Many inquiries have been received at the office of the Georgia Forest Service regarding the price of seedlings available next season. We are quoting the prices of the different species of seedlings which will be available at the state nurseries, for the 1936 crop:

Slash pine	\$2.00 per thousand
Loblolly pine	2.00 per thousand
Longleaf pine ..	2.00 per thousand
Black Locust	3.00 per thousand

These prices are f. o. b. Albany for slash and longleaf pine, and f. o. b. Blairsville for loblolly pine and black locust.

It has been the custom in the past for the Forest Service to pro rate the orders, if there were not enough seedlings to fill all orders received. It will be the policy of the Division of Forestry in the future to file the orders as they are received, and fill them in this manner.

Orders have already been received for approximately two-thirds of the seedlings that will be available. Those interested in securing seedlings for planting next season are advised to get their orders in as early as possible. Increasing demands upon the nurseries at Albany and Blairsville have made it necessary to increase the area planted. The area planted this year, however, will not supply sufficient seedlings to cover the demand. Something over three million seedlings were sold last season, and it is expected that more than five million will be available for the coming season.

Those interested in ordering seedlings may send their orders, together with a small deposit, to the State Forester, 435 State Capitol, Atlanta, Georgia.

THE TREE

A tree is thrifty; it uses the available material, and does not waste any. It produces wood, fertilizer, and food, conserves water, and provides for the future.

A tree is brave; it struggles against difficulties and persists in growing in competition with others, and even in discouraging surroundings and among enemies.

A tree is clean; it takes care of itself and discards its worn-out branches. Although growing in dirt, it produces clean wood, and even works at purifying the air we breathe.

A tree is reverent; it constantly looks up to God; and does not rebel. It respects the rights of others, and acknowledges the right of God to govern its life.

CUTTING LITTLE TREES DOES NOT PAY

The fact that small sized trees can be manufactured into lumber only at the expense of the larger ones is strikingly shown by the results of studies made by the Forest Products Laboratory of the U. S. Forest Service and summarized in the Copeland Report. It is, of course, well known to lumber manufacturers that small trees cost more per thousand feet to log, haul, and manufacture into lumber than do large trees.

Frequently, however, the tree size where the break occurs between profit and loss in lumber manufacturing is not known and, as a result, many small trees are cut that do not return even the cash outlay required to manufacture them. The reason that operations cutting small trees at a loss are able to survive is because the larger trees that are cut have a sufficient margin of profit to carry the small ones. The following table shows the net results of two studies conducted by the Forest Products Laboratory in widely separated parts of the Southern Pine region and in different years.

Although the two studies reported upon in the above table were made in areas as far apart as Arkansas and Virginia and under dissimilar conditions, it is notable that in both instances trees smaller than 12 inches in diameter at breast height (4½ feet above ground) cost more to manufacture into lumber than the lumber they produce could be sold for.

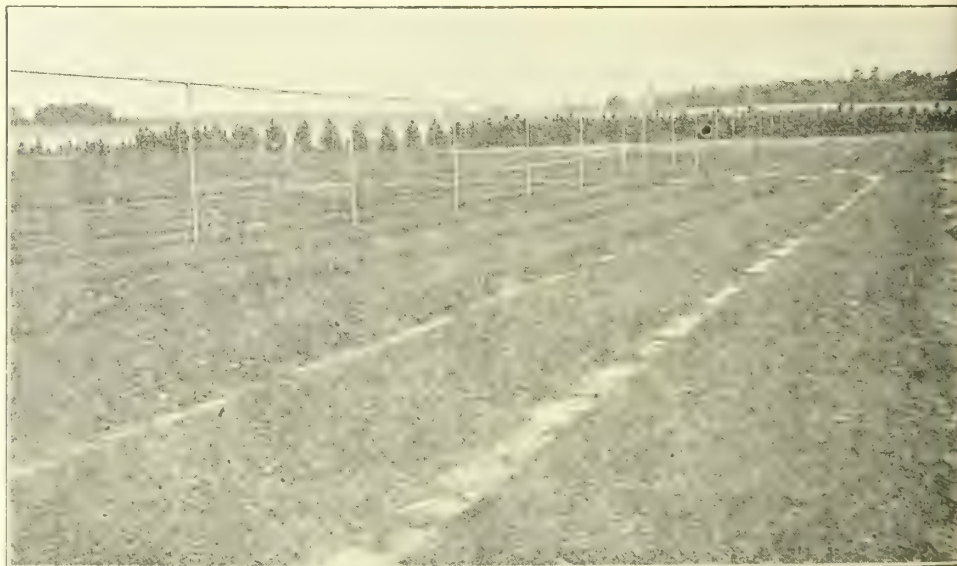
While it is entirely possible that some Southern Pine Lumber manufacturers can utilize profitably trees smaller than 12 inches DBH, it would be well for those cutting small trees to check the returns against the cost of lumber produced from such trees to determine whether or not they pay their way. Lacking such a check, operators can be on the safe side by not cutting trees smaller than 12 inches DBH (13 inches at the stump). Trees below 12 inches in diameter can be left standing with the assurance that they will grow from 2 to 4 inches larger in diameter during a 10 year period and, therefore, become profitable trees for sawmilling in the near future.

(Southern Pine Forestry Notes)

NET STUMPAGE REALIZATION VALUES

Tree Diameter at Breast Height	Shortleaf Pine (Ark. 1928)		Loblolly Pine (Va. 1931)	
	Per M. Bd. Ft. Per Tree		Per M. Bd. Ft. Per Tree	
8	Minus—	\$ 4.67	Minus—	\$0.41
10	Minus—	.05	Minus—	.33
12		3.08		.05
14		5.59		.85
16		7.59		1.99
18		9.36		3.42
20		10.92		5.29

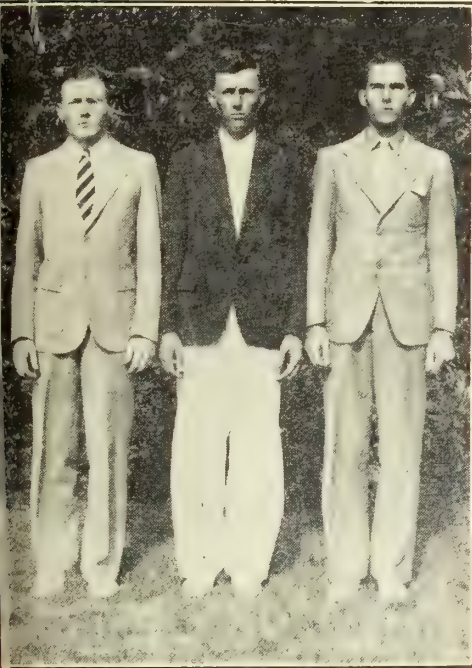
FORESTRY NURSERY—ALBANY, GEORGIA



View Showing part of Area Planted in Pine Seedlings. Approximately 5,000,000 Seedlings will be sold from this nursery next season.

OFFICERS ELECTED VOCATIONAL FORESTRY CAMP

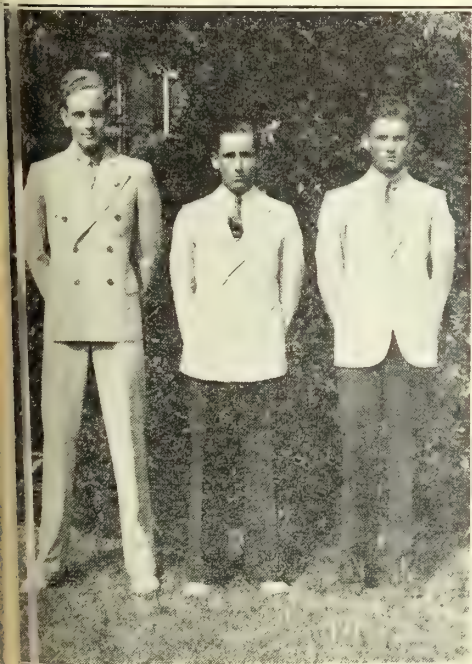
FIRST YEAR GROUP:



(Left to Right)

President.....William Clifton, Statesboro
Vice President.....Walzo Owen, Pelham
Secretary.....Thornwell Smith, Camilla

SECOND YEAR GROUP:



(Left to Right)

President.....Edward Stone, Oxford
Vice President.....Edwin Wing, Lyons
Secretary.....Albert Dorsey, Cleveland

LIONS CLUB OF TREUTLEN COUNTY ERECTS FORESTRY SIGNS ON HIGHWAYS

The Lions Club of Soperton and Treutlen County has sponsored the erection of five over-head signs across all highways leading into the county. As illustrated by the accompanying picture, on entering Treutlen County the sign proclaims:

**WELCOME TO
TREUTLEN COUNTY
LEADS THE WORLD IN PLANTED
SLASH PINE**

On leaving Treutlen County the sign reads as follows:

**"CITIZENS OF TREUTLEN COUNTY TAKE PRIDE IN PROTECTING THEIR
TIMBERLAND FROM FIRE."**

This progressive movement, illustrating the progressive attitude of the people of Treutlen County, is to be recommended to other counties of South Georgia and the State at large. These signs serve not only to tell others, but cause citizens of the county in which the signs are erected to make stronger efforts to protect their forest land from fire and otherwise practice good forestry.

—o—



Sign erected through efforts of Soperton Lions Club. 5 signs erected on County Lines.

Members of Lions Club shown in picture: J. E. Hall, Alton Rowe, M. L. Ricks, R. A. Perry, N. G. Reeves, Jr., D. R. Jackson,

A. O. Brinson, Lee McDonald, J. W. Fowler, W. M. Williamson, Jim L. Gillis, James Fowler, Ossie Hall, James Waller, T. M. Ricks, N. J. Deal, Steve Cocke, Will Stallings, R. M. Sparks and T. W. Cullens.

PAPER MILL AT SAVANNAH TO OPERATE SOON

A Second Unit to Be Built to Double Capacity.

According to an announcement made recently by Alexander Calder, President Union Bag and Paper Company, production at the Savannah plant will begin within another month. This information was formally stated in a letter to the stockholders, also giving the information that it was the intention of the company to erect a second unit at the plant which will double the capacity.

"It has been apparent for some time that we would require a second unit at Savannah," Calder said. "With this possibility

in view, the buildings at Savannah were made sufficiently large to house a second paper machine and necessary additional equipment. We have now decided to double our production of paper at Savannah and to make a surplus of approximately 25,000 tons of Kraft pulp annually for shipment to our Hudson Falls (N. Y.) mills."

Pointing out that a large operation of this type requires a certain amount of time before the various departments can be synchronized, Calder said the company did not expect immediately to receive the full benefits of lower production costs which this plant promises.

"We may show some improvement, however, as early as August," he said.

COST PER UNIT TO MAKE GUM SPIRITS TURPENTINE AND ROSIN GIVEN

Judging from the most carefully compiled consolidated statement of Profit and Loss and Costs per Unit and per Crop under the most modern audit control system that can be put into effect, as one learns from the figures of one of the largest factorage houses which for years has made an intensive and exhaustive study of the actual costs of producing naval stores, it is apparent that so far this year production has been carried on at a greater net loss to the producer than in the two previous years.

For the first four months of the calendar year 1936 on operations covering 230 crops, there was a net return at the port of \$40.00, total operating expenses of \$53.35, and net losses per unit of \$12.90. The net loss for May may have slightly reduced this figure.

It is interesting to know that on operations totaling 272 crops, with 38.25 units per crop in the calendar year 1934, there were total net woods operating expenses per unit of \$24.07, total overhead and general expenses of \$33.27, making grand total operating expenses of \$57.34, and a total net loss per unit of \$10.04. The net income at the port per unit was \$47.30.

For the calendar year 1935 on farms working 234 crops, with a production of 46.05 units per crop, the net woods operating expenses were \$23.70, the total overhead expenses \$31.85, grand total of operating expenses \$55.55, or a total net loss per unit of \$9.11. The net income at the port per unit was \$46.44.

It is unfortunate that there are many naval stores operators who have not installed a proper auditing system under which they can definitely ascertain the cost of each item of expense and get a clear picture of a year's operation. It will no doubt be of interest and of value to many to know how well audited operations give the detailed accurate items of expense.

This sub-division of the cost of operations in the audits for the calendar years of 1934 and 1935, 272 crops in 1934 and 234 crops in 1935, gives the following interesting comparisons as to producing costs per unit:

OPERATING EXPENSES

Cost of Producing Gum

	Per Unit	Per Unit
	1935	1934
Chipping	\$ 6.95	\$ 7.39
Dipping	3.34	3.40
Woodsmen	3.41	3.23
Hacks and Tools	.20	.29
Total	\$13.90	\$14.36

Cost of Hauling

Barn and Feed		
Expense	\$ 1.32	\$ 1.41
Hauling	.94	1.04
Gas and Oil and Parts	2.56	2.74
Total	\$ 4.82	\$ 5.19

Cost of Processing

Still Labor	\$ 1.12	\$ 1.14
Still supplies	.56	.68
Cooperage and Spirit Barrels	4.55	4.17
Total	\$ 6.23	\$ 5.99

Total Wood Operating Expenses	\$24.95	\$25.54
Less: Merchandise Gain	1.25	1.47

Net Woods Operating

Expenses	\$23.70	\$24.07
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Overhead and General Expenses

House Rent	\$.29	\$.28
Insurance	1.74	1.74
Legal	.28	.39
Office	.46	.48
Maintenance and Repairs	.48	.47
Timber Depletions	8.03	7.63
Plant Depreciation	3.96	3.87
Winter Expenses	7.12	6.88
Interest	4.16	5.40
Taxes	.85	.97
Rosin Inspections	.08	.10
Shipping	.92	.57
Hands' Accounts—		
Loss	.26	.39
Administration	3.00	3.16
Crude Gum	.22	.66
Miscellaneous		.28

Total Overhead

Expenses	\$31.85	\$33.27
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Grand Total Operating

Expenses	\$55.55	\$57.34
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It is pointed out that on present market basis there is a heavy loss on every unit of turpentine and rosin produced, and that as a result the producers are eating up assets or piling up debts.

(Naval Stores Review)

DID YOU KNOW THAT

The oldest known living thing in existence, a tree, the Sequoia Washingtoniana, now is found only in the Sierra Nevada Mountains of our West, says the Forest Service. The cousin of this tree, the Sequoia sempervirens, or redwood, is found only on the California coast. These trees, says the Forest Service, are the only known survivors of species which once spread over North America, Europe, and Asia.

PRESENT STATUS OF STATE PARKS IS EXPLAINED

Recent newspaper publicity in regard to Georgia State Parks has left many people with the mistaken idea that all of these recreational centers are already open to the public. Unfortunately, this is not the case. Eight parks, well distributed over the State are included in the system. Five of these have some facilities open to the public, although they are by no means complete.

Indian Springs State Park, located on State Highway 42, five miles south of Jackson, is ready to receive the visitor. All may drink from the spring famous in Indian lore for its healing waters. A stone shelter protects the spring. Foot trails lead through the surrounding woodland. A casino is available where soft drinks, sandwiches and smokes may be obtained. A small museum building for Indian relics has been constructed, but is not yet open to the public. Parking spaces, picnic grounds and rest rooms are ready. Private hotels, a swimming pool and other facilities are accessible nearby. No overnight cabins are available at this park.

Vogel State Park, located at Neel Gap on U. S. Highway 19, fifteen miles south of Blairsville, is being developed into one of the most ideal recreational parks within our system. Picnic grounds, woodland trails and lookout points are located in an area of beautiful mountain scenery. A lake in the valley three and a half miles north of Neel Gap is completed, but the combination bathhouse and boathouse is not yet open. Swimming is at one's own risk as no life guards are yet employed. The tearoom at Neel Gap is being remodeled and enlarged. Light lunches may be obtained at the present tearoom. Two overnight cabins accommodating four persons each are available at the Gap at a moderate cost. Reservations may be made by writing to Robert T. Furbish, Cleveland, Ga.

Santo Domingo State Park, on U. S. Highway 17 miles midway between Darien and Brunswick, is mainly an historical park. Beautiful trails passing through shaded areas, by dark lagoons, over rustic bridges lead one to ruins of an old Spanish Mission, an old English plantation site, and other interesting views. An attractive Spanish type inn is open to the public. Indian, Spanish, and ante-bellum plantation relics found during construction of the Park are on exhibit at the Inn. Meals are served at moderate cost by Mr. Edward Heecht, the park custodian. An admission fee of twenty-five cents per person is charged to help maintain this park. Historical Freedom on St. Simon's Island, beaches at St. Island and St. Simons, Brunswick Harbor and the old slaves at Darien are other interesting sights outside the park but in accessible distance.

(Continued on Page 8)

FLUORESCENT MINERALS

Reported by THE DIVISION OF GEOLOGY

Goeffrey W. Crickmay

The Division of Geology has recently installed on the fourth floor of the State Capitol near the elevators a case of fluorescent minerals which has attracted considerable attention. These minerals have the unusual property of glowing with a color and brilliance somewhat different to their color in ordinary light when they are exposed to ultra-violet rays. This article gives briefly an explanation for this seemingly strange phenomenon, together with notes on the occurrence and properties of the fluorescent minerals.

Early in the 16th century a shoemaker of Bologna, who was something of an alchemist as well, noticed that certain minerals which he had picked up from neighboring hills continued to shine brightly in the dark after exposure to light. The discovery aroused considerable discussion amongst the scientists of the day. Other minerals, it was discovered, glowed brightly when heated slightly; and still others became luminous in the dark when they were rubbed vigorously. This unusual phenomenon remained nameless and unexplained for more than 300 years, when in 1852 Stokes gave it the name of fluorescence from the mineral fluorite or fluorspar, as it was then called, for this mineral glows brilliant blue when exposed to appropriate rays. Stokes showed that the phenomenon was due to the absorption of light of short wave length, mainly shorter than violet light, which has the shortest wave length to register on the human eye. This same scientist was the first to show that the light given off by the minerals is always of longer wave length than the light which excites it to glow, but the reason for this was not clearly understood until modern physics developed our present conception of molecular structure.

Without burdening the reader with details of atomic make-up, it will suffice to say that the electrons of the atom are regarded as maintaining certain energy levels. If an electron is displaced from one energy level to a higher one by some outside force it will bounce back to its former position and in doing so will give up the lost energy in the form of heat or light. The electrons can be excited to a higher energy level by several means, of which light rays are the most important in relation to the present subject. When appropriate light rays strike a crystal their energy may be sufficient to displace the normal position of electrons, but when these electrons bounce back into their proper positions the energy received by the blow which dislodged them is given up as fluores-

cent light. As part of this energy is lost as heat, the emitted light has less energy than the exciting light, or in other words, the fluorescent light has longer wave length than the rays under which the mineral is placed. Thus if certain minerals are placed under a lamp giving off light of wave length shorter than violet, that is beyond the lower limit of human vision, they will glow with a light whose wave length is well within the range of human vision.

There are a number of lamps designed to give off a maximum amount of ultra-violet light with a minimum amount of visible light. One of the cheapest lights is a small 2-watt bulb filled with argon, which can be bought for fifty cents. These are the lamps that have been used for night prospecting at Stone Mountain, as described below. Two or three lamps can be used together on the ordinary 110-volt circuit to give the amateur collector a small but beautiful display. A much more powerful and effective lamp is the mercury arc with appropriate filter to cut down the visible light to a minimum. This type of lamp equipped with a nickel-cobalt glass filter is used for the exhibit at the State Capitol. The iron spark and the carbon arc are also used as sources of ultra-violet light. Each type of lamp gives off light rays of particular wave lengths and for this reason some minerals fluoresce brilliantly under one lamp and not at all under another.

There is no satisfactory explanation for the fact that only certain minerals or even only certain specimens are fluorescent. The exhibit at the Capitol includes calcite from a cave at Marble Hill, Pickens County, of which two specimens glow a delicate salmon-pink while a third glows a dirty greenish-gray. Fluorite from England glows deep blue but similar fluorite from Georgia is not at all fluorescent. There is no general rule that determines the color of fluorescence. Many minerals fluoresce a similar color to that in ordinary light but generally with more brilliance. Red corundum from Habersham County fluoresces ruby red; resinous yellow amber from the Baltic Sea fluoresces limpid pale-yellow. Most fluorescent minerals glow under the ultra-violet lamp with a color quite different from their natural color. Violet and green fluorite from England glows brilliant blue; white hyalite from Stone Mountain glows green.

The hyalite at Stone Mountain is the most brilliantly fluorescent mineral in Georgia. The mineral occurs as a thin coating on joint planes in the Stone Mountain granite,

but because of its white color it is difficult to find. The Division of Geology made a search for the mineral at night with small argon bulbs attached to two 45-volt "B" batteries. These bulbs require at least 80 volts and with direct current only half of the reflecting surface glows, but this equipment was found to be a most useful aid in finding choice specimens of hyalite. The mineral can be seen at night when the lamp is as far as six feet away, and an entire quarry can be "prospected" in a few hours. The finest specimens of hyalite were obtained from the quarry of the Ethel Granite Corporation. It was found that the hyalite which fluoresces most brilliantly has a pale-green color when viewed in sunlight. This is due to fluorescence in response to the ultra-violet rays in sunlight, as can easily be demonstrated by interposing a suitable filter which absorbs the ultra-violet rays and the green color disappears.

Some localities are famous for the variety of fluorescent minerals to be found, but again it is not understood why this should be so. Many fluorescent minerals are commonly associated with certain manganese and radio-active minerals. Many noteworthy minerals at Franklin Furnace, New Jersey, showing this phenomenon contain manganese or are associated with manganese minerals. The hyalite of Stone Mountain is found with uranophane, a calcium uranium silicate with radioactive properties. It has been suggested that many minerals owe their fluorescent properties to the inclusion of impurities.

Fluorescence is not simply a phenomenon for scientists to play with; it has many useful applications. Rays of very short wave length, X-rays, are able to pass through the human body but are blocked by bones, and on this principle X-ray photographs are taken. The same principle is used in the fluoroscope: X-rays are passed through the body and projected on a fluorescent screen where all the bony parts appear as non-fluorescent "shadows." Fluoroscopes have now a wide variety of uses ranging from proper fitting of shoes to elaborate and delicate bone operations. Fluorescent paints have been used for tinting stage costumes and scenery to obtain unusual effects. Chemists have used ultra-violet light to detect minute traces of certain oils and chemicals that have a characteristic fluorescence. In a similar way spurious paintings and documents have been detected by examination under ultra-violet light.

Fluorescence was first discovered in minerals, and it is thus appropriate that the phenomenon also has application in geology and mining. Some minerals that possess this property are valuable ore minerals occurring in rocks of similar appearance from which the hand-picker can separate them with difficulty. When, however, the picking belt passes through a room lighted only with ultra-violet light, the valuable ore takes

on a brilliant hue and can be rapidly separated from the dark and worthless matrix. Recent work has shown that examination of rocks in mines by ultra-violet light frequently reveals structures and relations that are not apparent in ordinary light but which are most helpful in determining the extension of ore bodies.

The mineral exhibit at the State Capitol includes the following minerals: (Ordinary light is abbreviated to O. L., and ultra-violet light to U-V) Amber from the Baltic Sea (gift of W. B. Pitts), resinous brown in O. L., limpid pale-yellow in U-V.

Autunite from North Carolina (gift of Ward's Natural Science Establishment), brown in O. L., grey-blue in U-V.

Calcite from Marble Hill, Pickens County, Georgia, white in O. L., pink and greenish-gray in U-V.

Calcite from Franklin Furnace, N. J. (gift of H. H. Hess), white in O. L., red in U-V.

Calcite from Franklin Furnace, N. J. (gift of W. B. Pitts), pale pink in O. L., red in U-V.

Colemanite from California (gift of W. B. Pitts), white in O. L., pale pink in U-V.

Collinsite from British Columbia (gift of Geological Survey of Canada), earthy brown in O. L., resinous yellow-brown in U-V.

Corundum from Habersham County, Georgia, pink to red in O. L., ruby-red in U-V.

Fluorite from England (gift of Prof. W. E. Ford and J. Lester), green and violet in O. L., brilliant blue in U-V.

Fluorite from Ohio (gift of J. Lester), brown in O. L., yellow in U-V.

Hyalite from Stone Mountain, Georgia, white in O. L., yellow-green in U-V.

Hyalite from Franklin Furnace, N. J. (gift of W. B. Pitts), white in O. L., green in U-V.

Opal from Habersham County, Georgia, waxy white in O. L., white in U-V.

Opal from Nevada (gift of W. B. Pitts), opalescent white in O. L., pale-green in U-V.

Wernerite from Quebec (gift of Geological Survey of Canada), pale yellow-green in O. L., golden yellow in U-V.

Willemite from Franklin Furnace, N. J. (gift of H. H. Hess and J. Lester), grayish to greenish white in O. L., brilliant yellow-green in U-V.

The Division of Geology welcomes this opportunity to express its thanks for the very excellent specimens that have been donated to the collection. The suggestions and advice of Mr. Frank E. Keener, of the General Electric Vapor-Lamp Company, were most helpful in making the installation.

FROM A GEOLOGIST'S NOTE BOOK

Vocational Forestry students at the recent summer camp sponsored by the Georgia Forest Service and the Department of Education at the Abraham Baldwin Agricultural College, Tifton, Georgia, from July 5th to July 15th, enjoyed in addition to their forestry studies a short course in Geology given by members of the State Geological Survey. State Geologist Richard W. Smith gave a lecture on "Conservation and Utilization of Georgia's Natural Resources" in which he stressed the necessity for topographic mapping, stream gauging, development of mineral resources, and proper exploitation of natural scenic wonders. Assistant State Geologist Lane Mitchell talked to each class on the "Span of Geologic Time" and "The Mineral Resources of Georgia." Mr. Mitchell stayed for the length of the camp and accompanied the students on field trips where some rock and mineral specimens were found. The interest manifested by the students indicated that these young Georgians are very enthusiastic in learning of the State's resources and the ways to develop them.

The Division of Geology has secured from the Superintendent of Documents at Washington, D. C., ten copies of U. S. G. S. Water Supply Paper 341 on "Underground Waters of the Coastal Plain of Georgia." These volumes will be sold to interested Georgians at cost, 50c.

State Geologist Richard W. Smith's quarterly report to the Commission of Forestry and Geology Development contained some statistical information concerning the service of the Geological Survey to the citizens of Georgia. 450 visitors to the office were supplied with the mineral or geological information or identification of mineral specimens which they desired. 8 classes of school children with teachers were furnished a guide to the State Museum. In the fall and winter this number is usually considerably larger. 485 letters were answered in which desired mineral or geological information was given. 200 bulletins were distributed in addition to circulars, handbooks, pamphlets, and copies of this magazine. Although these figures bespeak a great service to the State, they do not tell the whole story by any means. Other services included examination of mineral properties, well, dam, and quarry sites; compilation of statistical data; dissemination of publicity and educational facts; care and enlargement of the museum; fostering of interest in mineralogy, geology, and archaeology; and miscellaneous services too numerous to mention.

STATUS OF STATE PARKS

(Continued from Page 6)

Alexander H. Stephens Memorial Park at Crawfordville on State Highways 12 and 47 centers around Liberty Hall, the home of Alexander H. Stephens, Vice-President of the Confederacy. The home of the "Great Commoner" has been restored as it was in his day and his grave is nearby. A lake and bath house are open to the public with a ten cent charge for bathing. Trails, picnic facilities, rest rooms, an observation tower, and a wading pool for children are also available.

Fort Mountain State Park is on top of Fort Mountain, ten miles east of Chatsworth and two miles north of State Highway 2, the scenic highway through the Cohutta Mountains from Chatsworth to Ellijay. The view of the valley from this park is superb. Picnic grounds, parking areas, trails, lookout points, and an observation tower are ready for the public. An old stone fort of unknown origin has been restored. No overnight cabins are available and no admission is charged.

Pine Mountain State Park, near Chipley, Chehaw State Park near Albany, and Little Ocmulgee State Park near McRae are all under construction and do not yet have any facilities open to the public.

Legislation to provide for maintenance and further improvement of the State Parks will be sought at the next session of the Legislature.

Not to be confused with our own State Park system are Chickamauga-Chattanooga National Military Park near Chattanooga, Kennesaw Mountain Battlefield Site near Marietta, New Echota Memorial near Calhoun, Ocmulgee National Monument at Macon, Fort Pulaski National Monument near Savannah, and Fort Frederica National Monument (proposed) near Brunswick, all under the supervision of the National Park Service; and the Chattahoochee National Forest in North Georgia, under the supervision of the National Forest Service.

PUBLICATIONS GIVING INFORMATION ON FLUORESCENCE

The following publications contain authoritative information on fluorescence:

Slawson, C. B., *The Fluorescent Minerals*: Cranbrook Inst. Sci., Bull. 5, 1935.

Barrett, R. L., *A Comparison of Ultra-Violet Sources for Producing Fluorescence in Minerals*: *Am. Min.*, Vol. 19, pp. 578-586, 1934.

Several short papers in "The Mineralogist," January and February, 1935.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
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No. 9

HISTORY OF SLASH PINE---OF PARTICULAR INTEREST TO LUMBERMEN OF SOUTH

GROWTH MORE RAPID—ITS WOOD IS HEAVIER, HARDER AND STRONGER, AND YIELD OF CRUDE TURPENTINE LARGER AND OF A BETTER GRADE.

In covering two decades of all phases of the history of the Slash pine, Wilbur R. Matoon, of the U. S. Forest Service, in the June issue of the Journal of Forestry, traces the development of this species of pine from the spring of 1916, when it was practically unknown, to its present important position in forest management in its native region, and its possibilities in other sections.

Mr. Matoon started his silvicultural investigations of this special in the spring of 1916, using second growth trees. He was on a three months field trip originally planned to make a study of second-growth longleaf pine from North Carolina south to Florida, and west to southeastern Texas.

It was in Hardeville, S. C., that he noticed a different species of pine, which was identified as the "SLASH" pine. This species was known by the local people as "rosemary" pines, a name, however, that is equally applied in other sections to similarly large clear trees of shortleaf or of loblolly. During the rest of the trip, growth studies were made of this new species of pines along with that of the longleaf species. As the trip progressed, favorable points were noted for later making more detail observations and measurements. It was on this trip that the town of Homerville, Georgia was marked as the "center of gravity of the slash pine."

Another result of Mr. Matoon's study was the earliest known bulk collection, seed distribution, and seed sowing for reforestation purposes. In the fall of the same year some seventy pounds of slash pine seed were collected for the Forest Service. These seed were widely distributed. The recipients included the Georgia Forest School, then a part of the University of Georgia and at that time the only forest school in the south. Other recipients were nurserymen in several foreign countries, including France and Japan.

Mr. Matoon's impressions regarding the occurrence and the promise of the slash pine for silvicultural management, as

formed on his trip, were expressed in an article from which the following passage is quoted:

"Slash pine is fast replacing the longleaf pine over portions of the coastal plains of the south, as the loblolly is doing in the northern part. Intrinsically it is a better tree than the longleaf. Its growth is more rapid, its wood heavier, harder and stronger, and its yield of crude turpentine larger and of a better grade. The chief cause of its spread is its frequent and abundant seed production, very rapid growth, tolerance, ability to withstand the combination of both hog and fire, and capacity to adapt itself to a wide range of environment. It appears to have in a high degree the necessary qualifications for being handled on a large scale under approved methods of silviculture."

According to the U. S. Forest Service the Slash pine will yield a greater quantity of wood per acre over a period of years than any other species. The table below shows figures, giving the Normal Second Growth Pine in cords (4x4x8) per acre—unpeeled. All trees 4 inches and over diameter breast high.

Since the experiments of Dr. Chas. H. Herty have definitely proven that paper and pulp of a grade equal, or superior to that made from other trees can be made from slash pine, the land owners of the entire southeast have planted great acreages in this species of pine. They have not only planted abandoned areas in this species but have begun to protect, on a systematic method, the areas of natural production.

With the manufacturers of white paper, pulp and kraft paper rapidly turning their attention to the south as a source of wood for the manufacture of these products we predict that this industry will be one of the leading sources of revenue for the lumbermen of the south within a few years. Plants have already been estab-

(Continued on Page 3)

LIVING MEMORIAL IS DEDICATED TO THE AUTHOR OF "TREES"

AREA TO BE KNOWN AS KILMER MEMORIAL FOREST

With very impressive ceremonies, an area far back into the mountains of North Carolina, in the Nantahala National Forest, was officially dedicated on July 30 as the Joyce Kilmer Memorial Forest. Eighteen years prior to this date Kilmer was killed in action in France.

Joyce Kilmer was born near New Brunswick, N. J., December 6, 1886, but spent much of his time in the Berkshire Hills in Massachusetts during his boyhood. After his college years he moved to New York, where he followed a literary career, and was author of many articles, stories and poems. It was during this period, in 1913, that he wrote the poem "Trees," said by many to have been his expression of his dislike of living in a great "stone box." He finally chose a home in the wooded hills of Ramapos at Mahwah, N. J., where he wrote much, including poems on nature themes.

During the World War he was attached to the intelligence department of the 165th Regiment in France. He was killed in action in the Wood of the Burned Bridge late in July 1918, and was buried near the spot where he fell.

The memorial comprises approximately 3,840 acres, the entire watershed of Little Santeetlah Creek in Graham County, North Carolina. It will be available to the public for recreational, aesthetic and scientific purposes, and will be under administration of the Forest Service Personnel of the Nantahala National Forest. No commercial activities will be permitted within its area.

The establishment of the Memorial Forest was the result of the cooperation of the Veterans of Foreign Wars and the Catholic Writers Guild of America with the U. S. Forest Service, to honor the memory of Alfred Joyce Kilmer as an outstanding lover of trees. Through his poem "Trees" and other writings he reflected the spiritual relationship of the forest and trees to men.

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

THE EFFECT OF EROSION ON SOILS

By W. O. Collins, Professor of Soils, College of Agriculture, University of Georgia, Athens, Georgia

Soils are the products of weathering, both chemical and physical activities entering into the formation of soils from our rock and mineral matter. The reactions necessary to bring about the disintegration and decomposition are of necessity very slow since they are caused by change of temperature, rainfall, frost action, wind and running water. It can be seen from these statements that the formation of soil is an exceptionally slow process from the standpoint of time. However, it is necessary for this lapse of time to take place before a productive soil can be formed from the rock and mineral matter. Then after this material has disintegrated and decomposed, an accumulation of organic substance, largely the refuse of plant and animal life that ordinarily live in the soil, must be incorporated into this mixture of rock and mineral matter before it is true soil.

Under natural conditions vegetation growing on the surface of the soil protects this soil from being washed away by running water or blown away by wind, so the process is continuous and cumulative. The older a soil gets theoretically, the more productive it should be.

When man enters into the picture of soils he removes this vegetation, plows up the soil material, plants and cultivates his crop and then allows it to remain idle and uncovered

during the fall and winter months. Consequently, the excessive rains occurring during those seasons run off the surface carrying soil material with it. The two main factors that influence the amount of soil lost are the slope of the land and the character of the rain. Ordinarily, the steeper the slope and the harder the rain, the more soil will be removed in a given time.

The soil of Georgia has been cultivated from a comparatively few years to as long as 150 years and in most cases no protection has been afforded these soils during the rainy seasons. Consequently, erosion has removed in many cases all the top soil and portions of the sub-soil. To replace these soils it is necessary to expose this soil forming material to the activities of weathering and then incorporate organic matter into this mixture, which is a slow and tedious as well as expensive process when attempted by man, and when left to nature, literally thousands of years are necessary to rebuild a fertile soil.

HOW TO CONSERVE SOILS

Our soils should be divided on the basis of the use to which they are best adapted:

First class: Productive land. This should include all of our soils with a comparatively level topography which can be farmed profitably without terracing or be covered with catch and cover crops.

Second class: Marginal land. Land which will return its profits from cultivation only under favorable conditions. In this class belongs the soils that must be terraced and covered with strip crops and cover crops to prevent erosion. This class includes the lands with slopes varying from 3% to possibly 10%.

Third class: Marginal-land. Land which will not return a profit under our average agricultural conditions. This includes steep slopes from 10% or above and also badly eroded land with less slope and other lands not ordinarily farmed.

RECOMMENDATIONS FOR TREATMENT OF LAND

First class: Rows should be run on the contour and green manure crops should be grown to maintain organic matter content of soils in order to control erosion and conserve moisture. This group of soil should be given first consideration if fertility and physical condition properly maintained at all times. Terrace as necessary to check erosion that has already started.

Second class: All of this group of land should be terraced to control erosion, cropped with close growing cover crops to be used as green manure or hay crops, and when clean cultivated crops are grown strip crops should occupy alternate strips to prevent erosion during the period when the clean cultivated crops are being grown. These lands should never be left bare at any time, being covered with catch and cover crops when not being used for cash crops. A good portion of this land should be also devoted to permanent hay crops and grazing

land or forest products.

Third class: Sub-marginal land should be either sodded to a heavy growing grass or replanted to forest crop. In the poorer areas the use of kudzu, wild honeysuckle and other rapid growing vegetation may be necessary to improve these lands before being reforested.

ROTATIONS AND FERTILIZATION

1. Winter cover crops when not sown broadcast should be planted in rows on the contour.

2. Winter legumes when grown on land other than the first class should be fertilized with superphosphates, and in some cases lime should be added to correct soil acidity.

3. Corn or hay crops should follow the plowing-in of winter legumes to utilize the nitrogen stored by the legumes, and if cotton is included in the rotation on this land it should come the second or third year after the legume is plowed into the soil. Crop rotation, green manure, and catch and cover crops control erosion, improve fertility, reduce the loss of plant food by erosion and leaching and thereby save the purchase of larger quantities of commercial fertilizer.

NEW MANUAL ON PRESURE TREATMENT OF WOOD

Providing for the first time a practical handbook on the science of treating wood with chemicals to prevent decay, a "Manual on Preservative Treatment of Wood by Pressure" has just been issued by the Forest Service, U. S. Department of Agriculture.

The practice of pressure treating cross-ties, poles, posts, bridge timbers and other wood used in permanent locations under conditions conducive to decay has been established for many years and is steadily growing, according to Forest Service figures. In the period 1921-30 more than 280,000,000 cubic feet of wood was treated annually. This was nearly twice as much as the annual average in the preceding decade.

However, practical wood preservers wishing to improve their practice and beginners wishing to learn the business have found reference material widely scattered, and much of it out of date and varied in authority. The manual, prepared to remedy this situation, was written by J. D. MacLean, senior engineer, of the Forest Products Laboratory, maintained by the Forest Service at Madison, Wis., in cooperation with the University of Wisconsin.

The publication is based on the results of extensive research at the Laboratory and on numerous experiments and observations made at commercial treating plants. Dr. MacLean has outlined the characteristics of both woods and preservatives as they affect treatment, and has set down in usable form the mathematical material needed in control of treating conditions. The book contains fifty working charts and tables.

CASH INCOME FROM FOREST PRODUCTS IS INCREASED OVER PREVIOUS YEARS

FOREST PRODUCTS SOLD FROM THE FARM RANK IN NINTH PLACE AMONG A LARGE NUMBER OF OTHER DIFFERENT LEADING CASH CROPS. RANKED FOURTH IN GEORGIA.

The cash income derived from the sale of forest products from the farm ranked in ninth place among a large number of other leading cash crops, according to information released recently by Bureau of Agricultural Economics.

The cash income obtained by the farmers by the sale of forest products from their farm amounted in 1934 to a total of more than \$62,000,000.00. This amount was exceeded only by the cash derived from the sale of eight other leading cash crops, as shown below:

Forest Products	\$62,782,000
Hay	85,898,000
Corn	110,888,000
Potatoes (Including Sweet Potatoes)	150,350,000
Tobacco	240,937,000
Truck Crops	289,169,000
Wheat	249,045,000
Fruits and Nuts	436,191,000
Cotton (Lint and Seed)	722,842,000

The cash income to farmers from forest products sold represent an increase of approximately 3 million dollars over that of 1933 and approximately 8 1-2 million over

that received in 1932. In 1934 the timber products sold comprised roundly 53 per cent of the total value of all forest products cut from the farm, the remaining 47 per cent being used for home and farm maintenance and improvement.

The large items of material sold include standing timber in the bulk and cut products such as fuel wood, logs for lumber and veneer, pulpwood, fence posts and some poles and piling.

Forest products cut and sold for cash and sold from farms as a cash crop in Georgia ranked fourth as compared with other crops.

HISTORY OF SLASH PINE

(Continued from Page 1)

TABLE SHOWING CORDAGE PER ACRE

	15 Years Cords Per Acre	20 Years Cords Per Acre	25 Years Cords Per Acre
Loblolly Pine			
Good Land	24	37	50
Average Land	18	27	37
Poor Land	12	17	24
Longleaf Pine			
Good Land	20	30	40
Average Land	9	17	24.5
Poor Land	2	4	8
Shortleaf Pine			
Good Land	15	30	43
Average Land	---	---	31
Poor Land	---	---	15
Slash Pine			
Good Land	37	46	53
Average Land	27	35	42
Poor Land	12	20	26

lished in various sections of the south for the manufacturing of kraft paper.

In this connection we would like to insist that the buyers for these mills pay the timber growers a price from which they can realize a living. Reports have come to our attention that the timber growers were being paid a price per cord far below the amount that will give them a fair profit for their product. In some cases it has

been reported that wood is being purchased for as low as \$4.00 per cord. This price is too low. Timber growers, not only in Georgia, but of the southeast should be paid at least \$6.00 per cord. With the price of paper and pulp selling for the price they are today this would still give the manufacturers a fair profit for their production.

BLACK LOCUST POST SEVENTY-FIVE YEARS OLD IS STILL IN USE

FOUND BY SOIL CONSERVATION WORKERS ON JACKSON COUNTY FARM

A perfectly sound black locust post that has been in continuous use for more than seventy-five years was found recently by workers in the Soil Conservation Service on the farm of Jarrel Jarret in the eastern part of Jackson County.

This post was set in the ground before the war between the States. A gate swung to it for a long period of time. The post is well preserved today, and is being used as a post to fasten fence wire.

The black locust is one of the fastest growing hardwood trees, is durable in contact with the soil, consequently it has been and is still being used for fence post. A large number have also been used recently by farmers as a means to check soil erosion. They will grow on denuded areas, on gully banks, and the trees very effectively prevent the washing away of the soil.

Under favorable conditions the black locust will produce durable fence post in from twelve to fifteen years. Trees 30 feet high and five to six inches in diameter are commonly grown in fifteen to twenty years.

This tree is not only good for checking erosion of the soil but is also a legume. It draws from the unlimited supply of nitrogen in the air and deposits it in the soil, thereby increasing the fertility of the soil. Its lasting qualities as fence post are greater than those of any other native Georgia wood.

Black locust reproduces freely from root suckers, stump sprouts, and seed which are nearly always fertile. The seed should be planted in the spring, but the seedlings may be planted in the fall. It will grow throughout the entire northern section of the State and in all soils and conditions of moisture except in swamps. It is found as a forest tree, however, in the mountains, where it attains a height of 80 to 100 feet and a diameter of 30 inches.

The Division of Forestry of the Department of Forestry and Geological Development operates a tree nursery at Blairsville, Georgia. Black locust seedlings are grown in this nursery for the benefit of the farmers and timber growers of Georgia. The price of the seedlings is \$3.00 per thousand. Any one desiring to purchase seedlings may send their order, with a small deposit, direct to the State Forester, 435 State Capitol.

Copies of the "Manual on Preservative Treatment of Wood by Pressure," Department of Agriculture Miscellaneous Publication No. 224, can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.

FIRST DISTRICT

**T P. Hursey, Dist. Forester,
ROME**

Education

In an effort to standardize vocational forestry in this section of the state, the district forester has developed a system of 27 lessons on forestry which will cover the things needed to apply to practical forestry on the farm. Nine lessons will be taught each year for the first three years, and it is intended that the senior boys will help the vocational teacher with the younger ones, which will tend to impress the senior with what he has learned during previous years. Each school will be visited three times during the scholastic year.

In the counties where TPO's now exist, a system of simple forestry educational subjects will be installed, if the Board of Education agrees to cooperate.

The Cherokee TPO is expanding slowly and it is expected that many of the thousands of acres signed last year and not paid, will cooperate this year. The district forester spent the week of August 10 in the county conducting a series of community meetings designed to show briefly the value of timberland and the effects of forest fires on a community.

The Martha Berry TPO is dead, but in dying it gave to northwest Georgia a TPO about eight times its size—the whole of Floyd county consisting of 190,000 acres of forest land. The county commissioners are putting up the money at the rate of one cent per acre per year. It is hoped that this is the beginning of an organization covering the entire district.

The Polk county commissioners in their last session voted to create a county wide fire suppression system, provided the county attorney ruled that it was legal to pay out funds for that purpose.

FOURTH DISTRICT

**R. R. Evans, Dist. Forester,
Columbus**

The outlook for planting pine seedlings in District 4 during the planting season ahead is most encouraging.

More than 60 per cent of the seedlings planted last season were killed either by last winter's freeze or this summer's drought, and it would seem that the land owners might hesitate to plant again, but such is not the case. Large orders have already been placed with private and state nurseries for planting stock, and it is expected that over 300,000 pine seedlings will

be set out during the next planting season.

One land owner in Harris county, who had set out 60,000 seedlings last year and lost heavily, is going to replant and has already placed a large order for pine seedlings.

Mr. J. Meade Tollerson, a Houston county farmer, is taking 40 acres of his farm out of cultivation for the express purpose of planting this area to slash pine.

SIXTH DISTRICT

**W. G. Wallace, Dist. Forester,
Savannah**

Tar City T. P. O. Acquires Fire Line Equipment

Mr. H. J. Brewton, Manager of the Tar City TPO with headquarters at Reidsville announces the purchase of a Caterpillar Diesel tractor and Hester fire line plow. This equipment has been delivered for several weeks, and it is the plan of the TPO to start fire line construction and maintenance work at an early date.

The members of the Tar City TPO are fortunate in having a primary system of truck trails, firebreaks, lookout towers and telephone lines constructed by the CCC which serves as a good foundation system on which to secure efficient fire protection at a reasonable cost.

The Tar City TPO is operating on a basis of two cents per acre assessment plus a flat charge to TPO members of three dollars per mile of constructed firebreak by TPO equipment. It is proposed to finance the purchase of equipment in this manner.

New Lookout Towers Attract Wide Interest

Several new 100 foot steel lookout towers have been constructed or are in a state of construction in the Savannah District. Among these is a completed tower erected by camp P-82, Reidsville, on lands of the Tar City TPO in Tatnall County; and, another completed tower erected by the Soperton side camp on lands of the Oconee TPO in Montgomery County.

A third tower is being erected by camp P-81, Bloomingdale, at Ellabell in Bryan County, the land being listed in the Ogeechee TPO. A fourth tower has been approved for construction on the Coastal TPO area in McIntosh County. This tower is approved at Eulonia, and is to be erected by camp P-92 from Brunswick.

EIGHTH DISTRICT

**H. D. Story, Jr., Dist. Forester,
Albany**

Inspections of plantings from seedlings purchased from the Albany Nursery in Southwest Georgia reveal the fact that in spite of prolonged drought these plantings show a high percentage of survival and will average around 85% survival.

Inspections have revealed that in some cases of a low percentage of survival this result was brought about by methods used by the landowner in planting, due to the fact that he was inexperienced and had not been informed.

As an example one plantation of 25,000 Longleaf was inspected and it was found that in planting the bud of the seedling was placed at least two inches below the surface of the soil, thereby causing the loss of approximately 97%.

To prevent such mistakes the nursery has had printed shipping tags bearing a brief summary of precautions and planting instructions to be observed which will possibly result in an increased percentage of survival.

Applications for seedlings from the Albany Nursery are pouring in and files reveal the fact that although an expansion was made and approximately 5,000,000 seedlings are available, the supply is fast becoming exhausted and only a small supply of Slash pine is yet available. There is however, a greater supply of Longleaf and Loblolly yet available. The present rate of demand will indicate that all available seedlings will be applied for by the latter part of September.

The Department has changed its policy for the year and will not prorate seedlings as in the past but will fill applications in order supplying one hundred percent, barring bad luck or an unforeseen loss of seedlings.

T. P. O. NEWS

ELLIJAY T P O—Forty-four fires have already been reported, "burning-over" a total of 2,035 acres, which is a fraction less than 4% of the acreage in the T. P. O. Two lookout towers are in operation, with one man alternating between the two, with a patrolman on duty when necessary. The fire fighting personnel of the T. P. O. consists of one patrolman, three smoke chasers, and one towerman.

The amount of young growth that will not re-seed, from damage caused by fire

in early spring and summer, will not run over ½ of 1%. We believe this to be a good record.

Our Secretary reports that the finances are in good shape. A 35% refund has been made and we still have cash in the bank.

H. E. PINSON,
Secretary-Treas.

Plans are under way for the development of a 4 county Timber Protective Organization in northeast Georgia, embracing the counties Habersham, Stephens, Banks and Franklin. The total area of these 4 counties is 612,480 acres of which, 379,805 acres or 62 percent, is in timber land. Favorable action has already been taken by the Grand Jury and County Commissioner of Habersham and by the end of the year it is hoped that the other 3 counties will act favorably towards the establishment of this unique organization for protection and the growing of timber.

It is believed that many thousands of acres now devoted to some phase of agriculture will be planted to trees which will bring the total forest area of the 4 counties up to 75 percent of the gross area.

The formation of this organization is necessarily slow because of the contacts to be made with various county officials and necessary presentments made by the Grand Juries of the counties interested. Grand Jury meetings will be completed by November and interested landowners and officials of the 4 counties feel that it is just a matter of time until necessary preliminary steps be taken so as to set up the organization on a financial basis.

Necessary funds will be provided on a basis of two cents an acre for the forested area, and funds secured by refund under the Clark McNary Law will be placed in the treasury to increase the working budget.

FOREST C. C. C. CAMP NEWS

CCC Camp P-82 at Reidsville, Georgia, has an interesting educational program, and all members of the supervisory personnel, as well as the officers teach one or more subjects.

It is noteworthy that in the range of subjects there is 100 per cent attendance at these classes, and much more interest is being shown than was at first expected.

It is interesting to note the range of subjects taught, which are as follows: Reading, writing, arithmetic, blacksmithing, cooking, current events, English, mechanics, spelling, surveying, telephone, algebra and

forestry; personnel foremanship, leathercraft, woodwork, interviewing, safety methods, geography.

By W. K. Peagler, Project Superintendent
P-82

Enrollees at Camp P-87 are engaged in one type of work that is peculiar to their location, in that our work, alone among the Private Forest Service Camps in Georgia, is in the mountain section. Due to the precipitous nature of the county, drainage construction for truck trails has to be of a very capacious and durable nature. To accomplish durability, and insure continued service, we have to employ rubble masonry, of native stone gathered in the vicinity. This is work that calls for quite a bit of skill, and a lot of hard work, but our men seem to take much pride in that part of the construction, and a number of them have become very proficient in laying stone. We are fortunate in having, among the Local Experienced Men, some who have long years of such work behind them, so that they are able to give competent instruction to the younger men. In fitting these structures to the requirements of the trail, it is proving necessary to build structures of varying natures. These include ordinary Headwalls, Piers, Abutments, and even Arched Culverts, in some cases. The boys are quite proud of some of their efforts, and with good reason, for they are a credit to the company, and most serviceable to the Truck Trail System.

The Forestry Department of Camp P-81, Bloomingdale, Ga., and men of the company have been working for the past few weeks in the Bryan County section of the Ogeechee Timber Protective Association.

A 100 foot Lookout Tower is now being erected at Ellabelle, Georgia by the men of the camp. The foundation has been completed and work on the steel construction will begin soon.

A crew has been working for some time on the telephone lines of this section. More than five miles of the new line which will link the Bryan County TPO members and the Lookout tower have been completed.

In addition to the work on the telephone lines, the steel tower, and fire break and trail work, the bridge crew is working in Effingham County on one of the largest bridges yet built by Camp P-81. The bridge is being built across the Ogeechee Creek near Eden. It is sixty-five feet long.

Educational Activities at Camp P-81 have recently been increased with the addition of several Vocational courses sponsored by the Forestry department officials.

Each member of the Forestry personnel sponsor and teach a class with enrollments ranging from fifteen to twenty-five.

STATE PARK NEWS

VOGEL STATE PARK is one of the oldest parks in Georgia. It is located in Union County, one hundred miles north of Atlanta in the Blue Ridge Mountains of North Georgia. The park is being visited by many who are leaving the heat of the cities for the cooling breezes of higher elevations.

On top of the Blue Ridge, at Neal Gap, two two-room cabins have been built, also a stone veneer tea room, all with modern conveniences. Trails, winding above mountain gorges and leading to other parts of the park have been built. The present tea room is being enlarged, when completed it will provide hotel accommodations for those who may visit the park.

A two-room rock trail-side cabin has been constructed on top of Blood Mountain. Material for this cabin was furnished by the Georgia Chapter of the American Legion, in honor of their Georgia dead. This cabin is open to anyone wishing to remain overnight on top of Blood Mountain.

One half miles north of Neal Gap beautiful picnic grounds, in which tables, open-air fireplaces, and a comfort station have been built. These picnic grounds are available to the public free of charge.

A large dam, creating a thirty acre lake, has been built just north of Neal Gap. A boat and bath house was constructed out over the lake, with four log cabins just west of the shore line. These cabins are not available to the public as yet but will be within the near future. Two additional cabins are under construction. These should be completed at an early date. Use of the lake is at your own risk.

Further development plans for the park call for a recreational building, and several additional cabins, a play field, more picnic grounds with more out-door fireplaces and tables.

Approval and appreciation of this park has been expressed by the thousands of people, representing all states in the Union, who have visited it.

FORESTRY A SCIENCE

Forestry, in the strict sense, is a science. It relates to the properties of wood; the best uses to which it can be put; the best conditions under which it can be grown. Management is an economic science applied to forestry and an increasingly important and appreciated phase of the question. Forest fire prevention, and insect and disease control and eradication are vitally important factors in the bigger issue. Then there is the "forest problem," the solution of which rests with an informed citizenry on the importance of the forests in their economic life.—Charles Lathrop Pack.

NAVAL STORES—ONE OF SOUTH'S LEADING INDUSTRIES

EIGHT SOUTHERN STATES PRODUCE MORE THAN HALF OF THE WORLD'S SUPPLY.

The question is often asked, "What do you mean by Naval Stores?" In answer to this question we might say that Naval Stores mean turpentine and rosin. They come from a certain species of pine. The Slash Pine that grows so extensively in the south is the leading species.

Naval Stores is probably the oldest of the American industries and its early history is replete with the romance of the settlements established along the Atlantic Seaboard by the English pioneers. As early as 1584 there is a record of a report made to Sir Walter Raleigh telling of the large forests of pine to be found along the North Carolina shore and calling attention to the fact that these trees would yield abundantly of pitch tar, rosin and turpentine. In 1606, a year before Jamestown was settled, the French had extracted turpentine from the trees in Nova Scotia. A record has been found that shows that a cargo of "Glass, pitch, tar, soap, etc., was transported from Virginia to England, probably the first exportation of naval stores from this country.

It has been well known for more than a half century that the south has been the largest producer of naval stores. What isn't so well known is that naval stores is a 40 million dollar crop, and that its products are used in every home, and by almost every person in the land. Approximately 50,000 persons are employed annually by this industry, receiving more than 15 million dollars in wages per year. During the 1935-36 season more than two and a quarter million barrels of rosin and over a half million barrels of turpentine were produced, four fifths of which was obtained from more than 100,000,000 slash and longleaf pine trees and the remainder by cooking old pine stumps.

Eight southern states produce approximately 65 percent of the world's supply of naval stores. Georgia ranks first among these states in the production of both gum and gum turpentine. The production of the eight southern states for the 1935-36 season is given below:

TURPENTINE AND ROSIN OUTPUT BY STATES

	Gum Rosin Barrels (500 Pounds)	Gum Turpentine Barrels (50 Gallons)
Georgia	909,407	275,450
Florida	466,929	141,416
Alabama	160,450	45,637
S. Carolina	5,716	16,697
Mississippi	32,271	10,045
Louisiana	15,311	4,733
Texas	5,657	2,066
N. Carolina	3,259	956

With a pine forest land area of more than one hundred fifty million acres and increasing interest in reforestation and fire protection, the south can continue to supply the bulk of the world's naval stores requirement. Not only will the south continue to produce the bulk of the world's naval stores requirement, but Georgia also will continue to produce the largest amount of both gum rosin and turpentine. Southeast Georgia is known today as the leading Slash Pine section of the entire southeast. Many million seedlings of this species are planted each year in this territory.

PROMINENT NAVAL STORE PRODUCER DEAD

H. W. Hall, Prominent Bullock County Citizen Well Known in Industry

The many friends of Mr. J. W. Hall, of the well known naval stores producing firm of J. W. & C. I. Hall, Swainsboro, Ga., will regret to learn of his death which occurred Wednesday, July 15th, in a Dublin hospital. He had been carried there for treatment about ten days prior to his death.

Mr. Hall was 75 years of age and was one of Emanuel County's most valued and honored citizens. He was active in business until his recent illness, having been the senior member of the firm of J. W. & C. I. Hall, composed of father and son, for the past thirty years.

The deceased is survived by his widow, two daughters and eight sons.

Interment was held in the family cemetery about four miles from Swainsboro on Thursday afternoon.

From A Geologist's Notebook

The William B. Pitts Collection of gems and polished stones on display in the State Museum has recently been enlarged by additional gifts from Mr. Pitts. Beautiful specimens of petrified wood, slabs of agate and jasper and onyx, and a number of cut stones comprise the new addition. The cut stone display now contains sixty-five different rocks and minerals. There is one case of beautiful jasper slabs, one of petrified woods, one of miscellaneous stones, and one of scenic transparent slabs. Several of the stones are from Georgia: amethyst, corundum, agate, and chalcedony. One of the stones is a beautiful jasper secured from the foundation rock of the new Golden Gate Bridge at San Francisco. Other stones have been secured from many other states and countries.

Lane Mitchell, Assistant State Geologist, has been granted a leave of absence for one year by the Department of Forestry

and Geological Development. Mr. Mitchell will be lent by the Department to the Georgia School of Technology where he will teach Ceramic Engineering during the absence of Dr. A. V. Henry, head of the Department of Tech. Dr. Henry has retired for a year in order to improve his health. Mr. Mitchell's new connection with Georgia Tech is expected to bring the Geological Survey in even closer touch with Georgia Tech and with the new Engineering Experiment Station, whose director is Professor Harry Vaughan, acting head of the Ceramics Department during Dr. Henry's absence.

The topographic maps of the Warm Springs, Ga. Quadrangle and the Thomaston, Ga. Quadrangle are now available in the form of advance sheets, subject to correction. They may be consulted at the office of the State Geologist.

The article on Water, Georgia's Unknown Natural Resource, in the July Forestry-Geological Review, has attracted considerable attention throughout the state. Several newspapers have written editorials pointing out the need for gaging the flow of Georgia's streams. A campaign is now under way to raise funds to start this work in advance of an appropriation by the Georgia legislature.

U. S. MINERALS YEARBOOK FOR 1936 ISSUED BY BUREAU OF MINES

The MINERALS YEARBOOK, issued annually by the U. S. Bureau of Mines, will have its 1936 edition come off the press early in September, according to an announcement received from Washington. The importance of ordering this volume immediately is stressed in the announcement, as every previous edition has been exhausted before the supply came off the press. This book can be purchased from the Superintendent of Documents, Washington, D. C. The price is \$2.00 and cash or money order is required. No postage stamps will be accepted.

According to John W. Finch, Director of The U. S. Bureau of Mines, "This volume provides in convenient form a comprehensive and accurate record of economic developments and trends in the mining industry of the United States for the information and use of producers and consumers of mineral commodities and of the general public. The factual data regarding the operation of the mineral industry of the United States in 1935 are presented and interpreted in this edition of the MINERALS YEARBOOK."

The 1936 edition will comprise 1089 pages, 69 chapters, and 154 illustrations. Many Georgia mineral producers and consumers will find valuable information in this book.

GEORGIA AS A MINERAL PRODUCING STATE

GEOFFREY W. CRICKMAY

Georgia's mineral deposits were unknown and undeveloped up to 1829 when the discovery of gold in McDuffie, White, and Lumpkin counties initiated a period of intensive prospecting all over the State. Gold is a magic word for a magic metal. It holds the same irresistible appeal to the prospector that nectar does to the bee, and like the bee who dips into every flower these early prospectors as hopefully dug into every hillside. No State Geological Survey was yet organized to show the systematic arrangement of the deposits or to point out the ore-bearing belts to which the prospector could advantageously restrict his efforts. A country in this initial prospectors stage, this stage of youth, is a country of pioneers whose creed is expressed in that age-old adage, "gold is where you find it." Ten years after the discovery of gold, Georgia had become one of the leading producers of this metal in the United States. The federal government established, in 1838, a branch mint at Dahlonega, in the richest part of the new gold fields, which during the twenty three years of its operation minted a total coinage of more than six million dollars.

But even at this early date it was evident that the mineral deposits of Georgia were but slightly known. The need for a complete survey was expressed by Governor Schley in his message to the general assembly in 1836. "These concealed treasures, which should be tributary to her knowledge and wealth, are worthy of your enlightened consideration, and the provision necessary to a full and scientific examination of them ought not to be longer delayed. I suggest, therefore, the propriety of employing a competent geologist to make a thorough survey of the State, with a view to the ascertainment of its mineral and agricultural resources and the proper location of works of internal improvement." As a result of the governor's appeal a Geological Survey of Georgia was inaugurated in 1837, but due to the interrupted support of the State legislature a permanent organization was not established until 1889. In the meantime new mineral deposits were discovered and developed. The brown iron ores of northwestern Georgia were mined as early as 1840, and in the crucial period of 1861-1865 they came to have immense strategic importance. The discovery of the rich copper deposits of the Ducktown basin, Tennessee, in the late forties initiated another

wave of prospecting in the northern part of the State. The discovery of important manganese ores in Bartow county led to the first production of manganese in the United States from this district in 1866. Georgia first developed as a metal-producing state, although a few non-metallic products were mined in small quantities as early as 1845.

By the time the present Georgia Geological Survey was authorized in 1889, mineral production, although relatively small, had become a stable part of the State's economy, and the youthful stage of prospecting had given place to the mature stage of development. The vast changes in the mineral map of the State which have occurred under the administration of the present Geological Survey are best visualized by a comparison of mineral production in 1888 with that in 1934. In 1888 the total mineral production of the State was valued at approximately a million and a half dollars of which slightly more than 45 per cent consisted of metallic minerals, mainly iron, gold and manganese. In 1934 the total mineral production was valued at \$6,837,709, of which only 2.5 per cent consisted of metallic minerals. At the present time kaolin, granite, marble, fullers earth, and cement are the most important mineral products of the State; what was their status at the time the Geological Survey was organized?

Granite was not systematically quarried in Georgia until 1869, and by 1888 the industry was well established with a production valued at \$467,000 derived almost entirely from Stone Mountain and Lithonia. The excellent granites of Elbert County were not quarried until ten years later.

The marble industry was definitely established with the organization of the Georgia Marble Company in 1884, and the production from the State in 1888 was valued at \$155,000. It is said that a commission from the State legislature visited the quarries near Tate in 1883 with a view to determining if sufficient marble could be obtained there for building the State capitol. Lacking the counsel of a State Geologist, the commission reported sufficient marble only for interior trim, and consequently the new building was constructed of Indiana limestone. It is therefore somewhat ironical that in 1894 Bulletin 1, of the newly organized Geological Survey gave an account of the marble deposits of the State in which detailed descriptions showed that there was enough marble in Pickens County to build many state capitols.

Kaolin and other clays were produced in 1888 in very small quantities. The first kaolin mine in Twiggs County was not opened until 1897 and the first in Wilkinson County not until 1908. Edgar Brothers, producers of clay in New Jersey and Florida, became interested in the kaolin of Georgia through reading a report on these clays by the Georgia Geological Survey. After careful investigation of the deposits described in this report the company, which was to become the largest producer of kaolin in Georgia, established in 1910 its first mine and washing plant in Wilkinson County. Bauxite was first discovered in the United States near Rome in 1887 but not until 1909 were the more important deposits of the Coastal Plain revealed through the work of Otto Veatch, Assistant State Geologist. A small production of cement from natural cement rock was reported in 1888 from northwestern Georgia. Not until 15 years later was the first Portland cement plant established in the State. Fuller's earth had not been mined in the United States at this time (1888), and not until 1907 was the mineral mined in Georgia. The phenomenal rise of the fullers earth industry in the State is directly re-

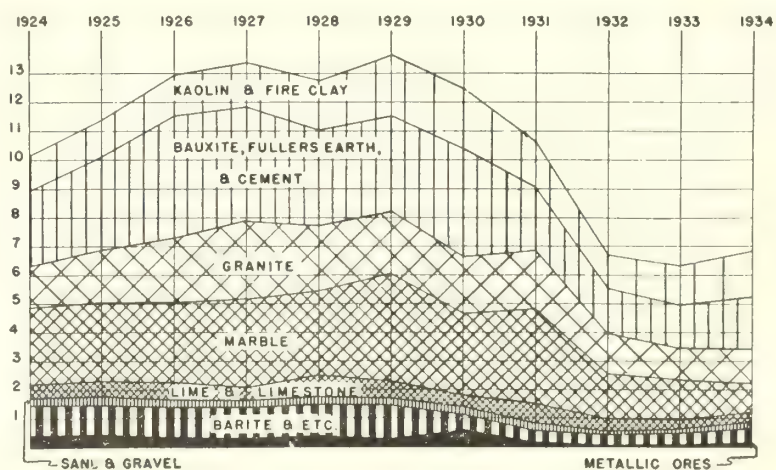


Fig. 1.—Mineral Production of Georgia by minerals, 1924-1934 in millions of dollars.

lated to increased use of vegetable and mineral oils.

One of the main functions of the newly established department of Geology was to collect trustworthy data, and to this end a series of bulletins were published giving complete and authoritative information on the occurrence, relations, and character of the various mineral deposits of the State. These bulletins have been responsible for the change from hap-hazard and unsystematic prospecting to an intelligently planned development of the State's natural resources. An analysis of production in the period 1924-1934 gives a clear picture of the present status of the mineral industry in the State. Two noteworthy trends are apparent; one towards increased production of the non-metallic minerals; the other, towards increased production from the Coastal Plain. Figure 1 shows that the "backbone" of Georgia's mineral production is made up of the non-metallic minerals, for the metallic minerals now comprise less than 3 per cent of the total. In 1924, 43 per cent of the total production was obtained from the Crystalline rocks, 31 per cent from the Paleozoic rocks, and 26 per cent from the Coastal Plain. In 1934, 34 per cent was obtained from the Crystalline rocks, only 11 per cent from the Paleozoic rocks, but more than half, 54 per cent, from the Coastal Plain. The present dominance of the Coastal Plain region is due mainly to increased production of Georgia clays during a time when production of other minerals, particularly building materials, dropped off considerably. Clay production has increased from 12 per cent of total production in 1924 to 23 per cent in 1934, while marble and granite production has fallen off from 40 per cent of total production in 1924 to only 32 per cent in 1934, this being an actual decrease of more than 50 per cent in value.

Georgia is not outstanding in value of total mineral production; in 1933 it ranked 36th amongst the states, accounting for only $\frac{1}{4}$ of 1 per cent of the total U. S. production. The State, however, is a leading producer of certain minerals: in 1933 it led all states in value of fullers earth and clay, it was second in production of barite, manganiferous ores, and micaceous minerals; and third in production of bauxite. In 1934, Georgia produced 67 per cent of the domestic production of white clays (kaolin) used for paper and china clay and 54 per cent of all such clays consumed in the United States. Ten years ago over 50 per cent of the United States consumption of these clays came from England.

The following table gives the annual average production during the eleven year period 1924-1934:

AVERAGE MINERAL PRODUCTION OF GEORGIA 1924-1934

Metallic Minerals ¹	\$ 285,000
Minor Non-metallic Minerals ²	1,033,000
Lime and Limestone	506,000
Granite	1,849,000
Marble	2,559,000
Bauxite, Cement, and Fullers	
Earth	2,862,000
Clay	1,559,000

Total Average Production...\$10,646,000

1—Gold, silver, manganese and iron.

2—Asbestos, barytes, coal, mica, slate, talc and soapstone, sand and gravel.

Many mining regions have passed through this mature stage of development into a third stage of senescence, a stage characterized by abandoned mines and ghost towns. The question naturally arises—What chance is there of Georgia entering this third stage? At one time Georgia was a leading producer of corundum, but the rise of artificial abrasives led to a gradual abandonment of the old camps, and at the present time little remains of the extensive corundum mills of fifty years ago. The brown iron ores of northwestern Georgia accounted for nearly 50 per cent of the total State mineral production fifty years ago but the rise of the iron industry in Alabama has resulted in a general abandonment of Georgia mines. Some of the old iron-mining towns, such as Sugar Hill, Bartow County, now consist of bare uninhabited buildings with hardly a trace of streets which were once a bustle of life.

The mineral industry of the whole State has no chance of ever becoming senescent. The non-metallic products are generally low-priced products which are not subject to the rapid fluctuations of metal mining. The non-metallic deposits are generally of immense size, for example, deposits of

of granite, marble, kaolin, limestone, and fullers earth, which are not quickly depleted. It is perhaps significant that the three leading mining states of the Union, Pennsylvania, Texas and California, are mainly producers of non-metallic products. The mineral map of Georgia will undoubtedly change in the future as it has in the past, but the State has attained a stage of maturity which insures a stability to the mineral industry. Future changes will be dependent not so much on the discovery of new mineral deposits as on the development of new uses for minerals and on cheaper methods of mining and milling. Abrupt change in foreign trade as a result of war may well deprive the United States of essential minerals which can not now be economically obtained from a domestic source. Georgia contains deposits of some of these essential minerals which will undoubtedly be developed in time of emergency.

The Division of Geology follows closely all new developments in the industry so that Georgia may obtain full benefits from new uses or processes which are applicable to mineral deposits in the State. Although the Division is not now equipped to carry out its own experimental work, it has promoted such work in cooperation with the U. S. Bureau of Mines and the U. S. Geological Survey. In a subsequent article in these pages the future of the mineral industry of the State will be discussed in some detail.

Educational Activities at Camp P-81, have recently been increased with the addition of several Vocational courses sponsored by the Forestry department officials.

Each member of the Forestry personnel sponsor and teach a class with enrollments ranging from fifteen to twenty-five.

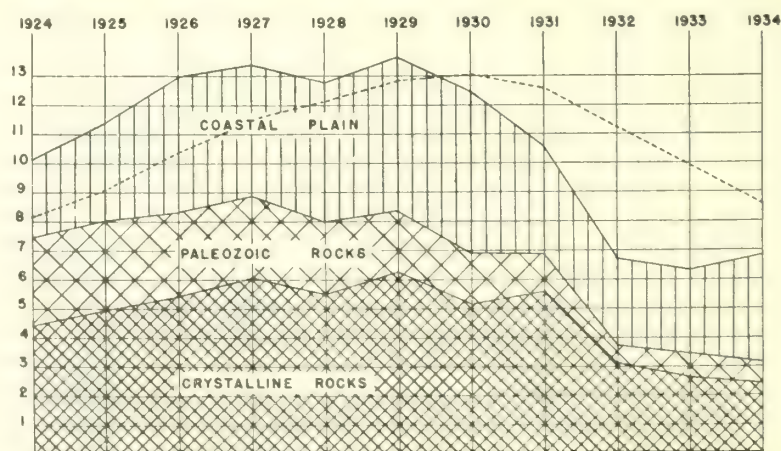


Fig. 2.—Mineral Production of Georgia by geologic areas, 1924-1934, in millions of dollars. Dotted line is sliding average of annual total production in five-year period preceding date shown.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

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No. 10

BE CAREFUL ABOUT STARTING WOODS' FIRES

FIRE SEASON NEAR—PRECAUTION SHOULD BE TAKEN TO REDUCE NUMBER OF FIRES

As the fire season approaches citizens of Georgia are cautioned to be careful about starting woods' fires. Forest Fire is the greatest enemy to timber owners every where.

There is a law in Georgia against setting fire to any woodlands. We are giving extracts from the Code of Georgia Law 1910 as amended August 8, 1927.

Article 2.

Firing the Woods.

SEC. 277. **WHO MAY.** No person but a resident of the county where the firing is to be done, owning land therein, or domiciled thereon, outside of any town incorporation, shall set on fire any woods, land or marshes, nor shall such person, except between the first of January and the first of March annually.

SEC. 228. **NOTICE.** When such persons shall desire to set fire within a set time, he shall notify all persons who occupy lands adjoining him, by residence thereon, or cultivation, or enclosure of any portion of the tract or settlement, of the day and hour of the firing, at least one day prior thereto. Such notice need not be given if, on sudden emergency, due caution should require firing to render one's premises safe.

SEC. 229. **PENALTY.** Any person setting fire in violation of the preceding section shall be guilty of a misdemeanor.

FOREST FIRE IS THE GREAT DESTROYER

- IT Blackens Millions Acres Every Year.
- IT Destroys Lumber And Robs The Homebuilder.
- IT Diverts Labor and Disrupts Industry.
- IT Stops Production And Robs The Community.

SEC. 230. **PENALTY FOR LETTING WOODS CATCH, ETC.** Persons, either by themselves or agents, who permit fire to get into woods, lands, or marshes through neglect, are within the meaning of the three preceding sections.

PREVENT FOREST FIRES—IT PAYS

Green Forests

- Yield abundant timber supply.
- Reduce lumber prices.
- Insure houses for all.
- Provide outdoor playgrounds.
- Increase streamflow.
- Build up communities.
- Support industries.
- Use waste lands.
- Creates national wealth.

Forest Fires

- Destroy green forests.
- Depletes our timber supply.
- Increases lumber prices.
- Devastate forest communities.
- Reduce streamflow.
- Sustain no industries.
- Drives away wild life.
- Lay waste the beauty spots.
- Reduces national prosperity.

After reading Georgia's forest fire law call the attention of others to it, let others read it, and help protect the forest and forest life.

COLLECTING, EXTRACTING, MARKETING SOUTHERN PINE SEED

Collectors Should Be Well Informed In
Order To Gather Seed Profitably
And Efficiently

During the twenty years from 1916 through 1935 the commerce in seed of longleaf, slash, loblolly and shortleaf pines has grown by extremely irregular stages from practically nothing to many tons of seed each year.

In order that seed collectors may gather seed profitably and efficiently they should be well informed on the method of gathering and the technical processes involved in the extraction of the seed from the cones.

Information of use to collectors is summarized in a paper prepared by Philip C. Wakeley, Associate Silviculturist, Southern Forest Experiment Station. A portion of this paper is given for the benefit of those who may be interested in gathering pine seed this fall.

"Much of the seed collecting so far carried on in the South has been done by men without special training in the work, or men collecting for one season only, and with no idea of creating a permanent business. As is usual under such circumstances, some of the seed has been poorly cleaned and of low quality, and much of it has been collected from any trees available, without thought of their possibly bad hereditary qualities. The situation offers a definite opportunity for skillful, reliable collectors and extractors who will concentrate their efforts upon cones from trees of high quality, develop sound and efficient methods of extraction, and certify the species, parentage, age, treatment, cleanness, and soundness of the seed they sell.

The southern pine seed business includes three technical steps—scouting, collecting, and extracting. It is well to scout cones before booking orders for seed, and to book orders for most of the seed to be collected before investing anything but spare time in the work. The collector who neglects these precautions faces the risk, on one hand, of accepting orders he cannot

(Continued on page two)

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

COLLECTING PINE SEED

(Continued from page one)

fill, and on the other, except possibly in years of scanty crops or of suddenly expanded state or federal planting, of tying up an investment in unmerchantable seed.

Cones can be collected most easily from felled trees. The disadvantages of this method, however, are that logging or other cutting is not always going on in bearing stands at the time cones are mature, and that cones from later crops cannot be collected from the same trees, no matter how desirable seed from those trees has proved to be. Collection from standing trees varies greatly in difficulty. Heavy crops of cones on longleaf and slash pine trees less than 40 or 50 feet high, with short branches and with the lowest living branches fairly near the ground, are relatively cheap to gather. Loblolly and shortleaf cones on similar trees, and cones of any species on tall trees with long, clear trunks and wide crowns, are far more expensive to knock down or pick. If seed is to be collected only from trees of the best form, it is easier to select such trees in uncut stands than on a logging operation. These points should be kept in mind while scouting for cones and estimate costs of collection. Before entering into contracts for large quantities of cones, it is well to time the picking of a few bushels and find out how long it takes and how much it costs per bushel.

Scouting for Cones

Estimates of the quantities of cones

available for collection should be based on counts of cones and of trees bearing cones, taken in the course of more or less systematic scouting trips over the territory in which the collector expects to work. The large cones of longleaf and slash pines are easy to see and can be scouted fairly accurately. Loblolly and shortleaf cones are much harder to see, especially on tall trees, and an accurate count is practically impossible, but, for his own protection, the collector should make sure that he can get at least the quantity ordered before he undertakes collection. No great harm is done if he somewhat underestimates the actual supply.

Table 1
Numbers of cones per bushel

Species	Usual number	Extreme values observed*	
		Lowest	Highest
Longleaf	100	86	118
Slash	200	157	243
Loblolly	500	393	1,080
Shortleaf	2,000	1,444	2,545

The number of cones available in an entire tract can be estimated by counting or estimating the cones on a number of quarter-acre or acre plots scattered uniformly over the area, reducing the figures to average number of bushels per acre and multiplying the number of bushels per acre by the number of acres in the tract. The more uniform the figures for the separate plots, and the greater the number of plots, the more reliable the final estimate will be. Fair estimates of the cones available on small tracts, or on the total number of trees to be cut on a given logging operation during the collecting season, may often be obtained by multiplying the total number of trees by the average yield per tree as determined by counting cones on 20, to, or 100 trees chosen at random to give a fair sample of the stand.

Scouting for cones can be done as early as May or June, because cones are full size

by then, and fairly easy to see. It is better, however, to scout in early August, because there is then less time between scouting and collection for drought, storms, and insects to injure the cones. In August, too, by cutting open a few cones from each of several trees, the collector can tell whether a fair percentage of the seeds contain kernels. It sometimes happens that in limited or even in extensive areas the cones contain few good seeds, while on other equally accessible areas nearby the seeds are of high quality; in such instances it is plainly to the interest of the collector to supply the better seed.

It is believed that the seeds of southern

pinus mature before the cones do; that is, that seed fit for use in nurseries can be extracted as early in the season as the cones can be made to open by drying. Collectors have experienced difficulty many times in the past both from gathering cones a trifle early without treating them as carefully as necessary under such conditions, and from gathering them very early and having them fail to open under any treatment. Unless the quantity of cones needed is so great that a long collecting season is essential, the safest plan is to wait until all cones have begun to turn brown, or even until the first few cones (usually those on the south sides of crowns) have begun to open."

The usual dates of maturing and collection of cones in Georgia and other southern states is October 1 to November 15. The time varying however, due to local and seasonal conditions.

Large Number of Seedlings Planted on TVA Project

More than ten million seedlings were planted by the Tennessee Valley Authority, in its program of watershed protection during the 1935-36 season, according to an announcement made recently by the Forestry Officials of the TVA Project. More than eight million of these trees, chiefly black locust and pine, were planted on cooperative erosion-control projects in the valley by crews from TVA-CCC forestry camps, and an additional two million were planted on land owned by the Authority.

Supervisors of smaller watersheds throughout the country are beginning to realize that the only way to protect their supply of water and insure a supply at all times is to reforest as much of their watershed as is possible.

CONE CROP BELOW NORMAL

Estimated To Be Far Below 1935

Except in Virginia, where there is a good supply of loblolly pine cones, the 1936 cone crop of longleaf, slash, loblolly and shortleaf pine is light, according to an announcement made recently by the Southern Forest Experiment Station, New Orleans, La.

The longleaf cone crop is definitely poor in South Carolina, Florida and central Louisiana, and poor to spotty throughout the rest of the range. The slash pine cone is definitely poor in southern Mississippi and southeastern Louisiana, and poor to spotty in southern Georgia, all of northern Florida, and southern Alabama. The loblolly is reported to be spotty in southeastern Georgia.

TYPE MAPPING PROJECT FOR SOUTHERN REGION

Georgia Ahead of Other States in Progress Already Made

The Southern Region of the United States Forest Service is undertaking a project of timber type mapping on private forest lands in the South covering detailed information of great value in forest fire control, according to an announcement of Joseph C. Kircher, Regional Forester for the Southern Region of the United States Forest Service.

Mr. Kircher states that this project which, promises to run into many millions of acres before it is finished, was inaugurated through a need for accurate fire control maps in protective forest lands. It was decided to obtain the data for these maps with the use of CCC enrollees from the seventy-eight State and private CCC camps in the following States, which are included in the Southern Region of the United States Forest Service: Georgia, Florida, North Carolina, South Carolina, Tennessee, Alabama, Mississippi, Louisiana, Oklahoma, Arkansas, and Texas.

The State of Georgia already has type maps covering eight million acres of private forest lands, the data for which has been compiled by these type mapping crews. Florida is making a start, type mapping 225,000 acres per month, and expects to double this figure in a short time. Texas, North Carolina and South Carolina each have started this work and the other States in the Region are rapidly organizing type mapping crews and it is expected that ultimately all State and private forest lands in the Region will be covered by this project.

Mr. Kircher stated that the data obtained includes an accurate map showing the roads, railroads, streams, fire breaks and topographic features. It will also include a type map showing twelve to fifteen easily recognized forest types, together with information on cultivated lands, savannas, marshes, beaches and various fire hazards, such as settlements, dwellings, etc.

The organization of each State provides for an experienced timber cruiser to head up the work. He will have an assistant in the central office and sufficient draftsmen to properly assemble the maps submitted by the camps. Engineers will be employed to direct the work in the several camps and to make accurate base line surveys. Foresters will be employed to direct the crews of enrollees in cruising the forest land between the base lines or otherwise obtaining the information called for. Enrollees in crews of two will run strip crews at intervals of one-fourth to one-half miles apart, obtaining the bulk of the information called for in the type map. Enrollees trained as draftsmen will assemble the data from the several crews for the camp map as the work progresses.

Mr. Kircher said that this procedure will give an accurate map that will be of much value in forest fire control. Fires are still the greatest problem facing forest conservation in the South, where the forests are the foundation of new and rapidly developing industries, and it is important that everything possible be done to protect from fire the trees which supply the raw materials for these industries.

STATE GEOLOGIST TELLS MINING ENGINEERS ABOUT GEORGIA KYANITE

Richard W. Smith, State Geologist, on September 24th to 26th attended the meetings of the Industrial Minerals Division of the American Institute of Mining and Metallurgical Engineers at State College, Pa., where he gave a paper on the Kyanite Industry of Georgia.

Kyanite is an aluminum silicate long known to occur in Georgia but only in recent years used commercially in the manufacture of high-grade refractories, especially those used to construct tanks for melting glass in glass factories. In 1932 the Georgia-Carolina Minerals Corporation, Mr. Philip S. Hoyt, President, of Franklin, N. C., began mining Georgia kyanite from a surface accumulation of kyanite crystals from a kyanite-mica schist in Habersham County. Later kyanite was also mined from a placer deposit by the same company, which is still the only producer. Mr. Smith in his paper has described these operations and also a new mill built this summer to recover kyanite, water-ground mica, and other by-products, directly from a deposit of the kyanite-mica schist that the company located from descriptions given in the report on the kyanite deposits of Georgia that was published as Bulletin 46 of the Georgia Division of Geology.

It is predicted that the low cost of this new mining and milling operation will result in a material reduction of the selling price of Georgia kyanite and ground mica, thus enabling these minerals to be used in many products where costs are now prohibitive. Georgia may soon become the largest producer of both kyanite and ground mica.

Copies of Mr. Smith's paper may be obtained at the office of the State Geologist, 425 State Capitol, Atlanta, Georgia.

Interesting Forest Facts

The Oak is called the King of Trees and acorns from oak trees were a food before anyone in Europe knew the grain we called corn.

There are about 800 different kinds of wood known to the timber trade.

MISS EMILY WOODWARD AUTHOR OF BOOK

**Reveals Interesting History of Georgia
In Pictures**

The glory of Georgia has been expressed many times in song and story but, in our judgment Miss Emily Woodward has gone far beyond the printed page in her recent book "Empire" and has depicted Georgia's unusual advantages in soil, climate, natural resources, educational opportunities and the charm of her people in pictures and short paragraphs, as many authors have tried to do in poetry and prose.

Realizing that the most lasting impressions come through the eye, the author conceived the unique idea of portraying Georgia pictorially. In doing this she has placed before the readers in picture form the high lights of Georgia history, giving the beauty of the mountains, the attractiveness of the seashore, the marvel of Georgia minerals, and forests, and the fertility of the plains.

In the making of "EMPIRE" she has definitely touched upon the essential requisites; religion, education, agriculture, industry, banking, transportation, merchandising and natural resources. She depicts modes of transportation from the time of the covered wagon to steamships, railroads, motor buses, and airplanes. Valuable camera views of the early churches, from the coming of the early settlers to the coming of John Wesley, are given. Educational institutions are generously sketched and nature lovers may find many opportunities to revel in the beauty of Georgia scenes.

It is doubtful if any other person could have succeeded so well in preparing and assembling such a book. She had the facilities of a well-grounded education, having been graduated from Wesleyan College, and having newspaper experience for a number of years, as Editor of the Vienna News. For four years she was a Vice President of the Georgia Press Association, and was elected President of this organization in 1927, thus becoming the first woman in the United States to be elected President of a State Press Association. In 1928 she organized the Georgia Press Institute, which was the first of its kind in the United States. Some years ago she had conferred upon her by the University of Georgia the degree of Doctor of Literature. She has also been very interested and active in the Forestry program of the State, being for many years a member of the Executive Committee of the Georgia Forestry Association.

We would like to recommend "EMPIRE" to the readers of the Review, giving assurance that no one will regret the \$3.00 that it costs.

Did You Know That

In South America are trees known as "cow trees" which, when pierced, yield a rich, milky, nutritious juice in such abundance as to render it an important article of food?

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

The Grand Jury of Stephens County, in session September 16, passed a resolution recommending that the county commissioners of this county pay into the treasury of a "Four County" Protective Organization, funds based on the forest area of the county at the rate of two cents per acre. Such funds to be used for the purpose of carrying out protection work as recommended by officers of the organization and representatives of the Georgia Forest Service.

This is the second county of the "Four County" unit to agree to participate in the organization, Habersham County having already passed similar resolutions.

The above organization when fully developed will embrace the counties of Habersham, Stephens, Franklin and Banks.

FOURTH DISTRICT

**R. R. Evans, Dist. Forester,
Columbus**

More than one hundred and fifty 4-H Club members, selected to represent their local clubs, attended a State Wild Life Conference held at an abandoned CCC Camp near Warm Springs, August 18-21.

County Agents, Home Demonstration Agents, and other visitors attended the camp from time to time, making the total to attend more than two hundred.

This was the first Conference of this nature ever to be held for the 4-H Club members. Much interest was manifested by those attending.

Such topics as; Wild Life Conservation, Forestry Conservation, Forestry In Relation to Wild Life, Game Birds and their Protection, Raising Quail in Captivity, Will Insects Destroy Us, Conservation of our Mineral Resources. Representatives from the Department of Forestry and Geological Development and Game and Fish, discussed these topics at various times during the Camp.

Motion pictures, pertaining to the natural resources as well as the Wild Life of the State were shown each night. Exhibits were prepared by representatives of the various state departments, which were very interesting as well as educational.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

T. P. O.'s

The Charlton County T. P. O. has recently purchased a new Athens plow and a new Chevrolet pick-up truck in addition to their regular equipment, so that the maintenance of ECW improvements and the construction of secondard firebreaks could be expedited.

The Consolidated T. P. O. recently purchased a grader to maintain the ECW improvements in their area.

The Altamaha-Satilla T. P. O. recently purchased a new Athens plow. All of the equipment belonging to this T. P. O. is practically new, having been bought since July, and they are now prepared to do some good work in their area.

The Wayne County T. P. O. is considering purchasing a tractor in addition to the one that they now own as one tractor cannot take care of the demand for plowing in their area.

Two new ECW steel towers have recently been completed in the Coffee-Jeff Davis area, one is under construction in the Appling T. P. O.; one is under construction in the Wayne T. P. O.; one will soon be started in the Charlton T. P. O., and one is being changed from one location to another in the Consolidated T. P. O. area.

Practically all of the T. P. O.'s in this District are now plowing secondard firebreaks or maintaining ECW improvements and this year promises to be one of the best that we have ever had insofar as the general activities of the T. P. O.'s are concerned. All Secretaries report good collection of assessments and a big demand for secondary firebreaks.

FORESTRY FESTIVAL

The Directors of the Slash Pine Forestry Association have been holding meetings lately to work up the program for the annual Festival to be held this year from November 10th to the 14th, inclusive.

A good program has been worked up with many good speakers, and it is now planned to have during the festival a play or drama showing the various stages of forestry development from the time of the early settlers up to the present time. Each night will be assigned to some county in this vicinity to depict some era in forestry. This promises to be an important feature of the program, the WPA has offered the assistance of their Drama Specialist of the Federal Theatre Project to work up this program. All forestry agencies are co-operating in this program.

EXCERPTS OF LETTERS TO SECRETARY OF THE FESTIVAL

"Your request for suggestions on the outline of your Association's proposed program" is noted. The outline gives every evidence of considerable thought on the part of some one in your organization and the objectives set forth are very commendable. . . . No one questions the immense potential resources of pulp-wood and lumber in the South, but with the large increase in pulp and paper mills drawing on these resources every effort must be made to secure correct forest management practices so that a substantial yield of raw materials needed by the mills is assured. I believe there is no more important objective that could be set up by your Association than that of sustained yield of forest products. . . ."

—Earl H. Clapp, Act'g Chief, U. S. Forest Service.

"Replying to your letter with reference to the preparatory work necessary to make the Slash Pine Forest Festival in November of this year the best it has ever been, I am writing to offer you my cooperation and to do anything in my power that you might call on me to do. I also offer you the assistance of Mr. Roy Dykes, forester on our project, for such assignments as you wish to offer him. . . ."

—J. A. Pearson, Project Mgr., Resettlement Administration.

"I am tremendously interested in the constructive program which you have in mind. I shall be glad to cooperate with you and yours in this program in any way I possibly can. Please feel free to call upon me for any service at any time."

—M. D. Collins, State School Commissioner.

"I sincerely appreciate your invitation to participate in your Slash Pine Forest Festival Program. I am deeply interested in this work. I feel that the future of our game and fish depends upon the continuation of the forests for shelter and cover for our wild life. I am sold on the value of stressing the possibilities of our natural resources and the need of their protection through these organizations."

—Zack D. Cravey, Commissioner of Game and Fish.

"I am glad to know that you are to have a better and bigger Forest Festival this year and I will be glad to direct our cooperative agencies in Georgia to assist in making your festival as successful as possible. I am today writing the United States Forest Service, the National Park Service and the Soil Conservation Service, calling attention to your forthcoming festival and directing them to give the fullest possible cooperation in putting on a creditable exhibit. I note your renewed invitation for me to personally visit Waycross this year

at the time of your festival. I have made a note of the date and if possible for me to do so it will be a great personal pleasure for me to be with you."

—Robert Fechner, Director, Emergency Conservation.

"The Journal and WSB, as you know, are tremendously interested in anything that will promote the Slash Pine proposition. The Journal has been hammering away at it for many years and WSB is nothing but a Journal instrument. Mr. Paschall is planning to have Dr. Herty up for our editorial hour soon and your festival will undoubtedly get some recognition then. Don't hesitate to keep us informed of your plans and don't hold back any suggestion whereby we can help you on the air. I see no reason why we can't do considerably more than was possible last year."

—Lambdin Kay, General Manager, Atlanta Journal Station WSB.

4-H FORESTRY CLUBS BEING ORGANIZED

In connection with the Forestry Festival to be held in Waycross during the week of November 10th to 14th, inclusive, and in conjunction with the ten year educational program set up by the Forestry Association, the 4-H Clubs of the southern section of the State are being organized into 4-H Forestry Clubs.

Due to the fact that the counties in the vicinity of Waycross derive their revenues mainly from forest products and realizing that this phase of the Agricultural work has not received the attention in the past that it deserves, the County Agents are giving their wholehearted approval of the ten year plan outlined by the Slash Pine Forestry Association.

It is now planned to give each 4-H Club member certain projects relating to protection, conservation and development of forest lands, wild life, and the raising of cattle in connection with forestry. After these members have fulfilled certain qualifications they will be given the title "Junior 4-H Forester", and will be given a certificate stating that they have successfully passed all tests given them.

All of the plans are now in the embryo stage at the present time but they have received the wholehearted approval of W. S. Brown, District Agricultural Agent, and G. V. Cunningham, State Director of Boys' 4-H Club Work. The following county agents; L. C. Walker, Baxley; M. Gordon Neesmith, Waycross; J. A. E. Cox, Nahunta; Chester Bennett, Pearson; W. V. Chaffin, Blackshear; W. T. Clary, Hazlehurst; Herman Neesmith, Alma; J. H. Chaffin, Jesup; R. E. Smith, Homerville; W. D. Jones, Folkston; and R. D. Franklin, District Forestry, Waycross, have been appointed to further develop the plans and lay the foundation for the organization.

W. S. BOOTH, PROMINENT TURPENTINE OPERATOR DEAD

Accidentally Killed September 5

W. S. Booth, Manor, Georgia, a large landowner and turpentine operator, was killed in an automobile accident near Waycross, Georgia, Saturday, September 5.

Mr. Booth was very active in Timber Protective work, serving as President of the Consolidated T. P. O. at the time of

his death. He was also a leader in other forestry movements in his section, always doing what he could to protect the forest lands from its worst enemy—FIRE.

CORRECTION

In the September issue of the Review it was stated that W. H. Hall was a resident of Bullock county. This was a mistake. Mr. Hall was a resident of Emanuel county. We are glad to make this correction.

EIGHTH DISTRICT

H. D. Story, Jr., Dist. Forester,
Albany

The State Nursery located at Albany, Georgia, is proving one of the points of interest in South Georgia, and is fast becoming known throughout the United States through the numerous visitors that have not failed to be attracted by the very artistic sign designating this point of interest and bearing the friendly phrase of "Visitors Welcome".

T. P. O. ACTIVITIES

Organized T. P. O.'s in the Eighth District are formulating plans for the coming



SIGN AT ENTRANCE OF STATE NURSERY—ALBANY, GA.,
WELCOMING VISITORS.

The Log Cabin located well back from the road on the well-kept carpet grass lawn, with drive-ways bordered by luxuriant growth of red verbena, has gone far toward making this nursery attractive.

In visiting this nursery visitors always find Mr. M. E. Murphy, the Nurseryman, very willing and anxious to explain in detail all phases of his work and to answer any questions that may be asked.

Mrs. Murphy, his charming wife, who takes the part of hostess has gone far toward making all visitors realize that the printed words on the Nursery sign, "Visitors Welcome", was not merely written for the effect, but is a reality.

fire season and everything seems to indicate that a large percentage of this land will be put in proper condition to again afford protection this year as that of last.

Two organizations of the Eighth District totaling around 150,000 acres each are at work upon plans for consolidation which will permit more uniform distribution of activities, closer relationship between co-operating agencies and in the long run is hoped that the increased acreage in the consolidated T. P. O. will permit more economical cost of protection to the landowner.

Committees have been appointed for this consolidation, but as yet no definite plans have been put into execution.

FOREST

C. C. C. CAMP NEWS

—Camp P-81 at Bloomingdale now boast a modern workshop and some real woodworkers. Several pieces of machinery have just been installed in the enlarged building. The little log workshop was built by the men in camp during their spare time. Members of the local TPO furnished the logs.

Captain Jack Walters, forestry Foreman is the instructor in woodwork activities. Classes are held each afternoon and evening.

From pole to tree, but still climbing, is the Telephone crew of Camp P-81. After completion of the telephone lines for the present work period, the telephone crew of Camp P-81 started gathering pine cones for the state nursery. The crew has been searching now for two weeks for slash pine cones.

Safety Meetings at Camp P-81 are held each Thursday afternoon after supper and are attended by all men of the camp. Forestry Foreman and officers talk to the enrollees about safety measures in camp, on the road, and on the job. A program of safety lectures has been planned which will include prominent safety engineers of Savannah.

Camp beautification at Bloomingdale has received the support of both Forestry foreman and Army officers as directed by the Educational Adviser.

Several walks have been completed and lined with flowers. More than ten thousand periwinkles have been planted on the camp grounds in addition to the zinnas, marigolds, verbenas and other spring and summer flowers.

Educational averages of the men of camp P 81 are as follows:

College Level—6.

High School level—56.

Elementary School level—120.

Illiterate—11.

Classes are held four times weekly for the illiterates where they are given individual instruction.

The enrollees of Camp P-90 have just recently completed a 100 foot steel lookout tower near Nashville. A telephone line connecting this tower with the tower near Lakeland is being rushed to completion to give the northern section of our work area an adequate fire detection system by the time the fire season begins.

The Army has recently installed a very efficient and up to date shop at the camp for the use of the enrollees who desire to

study manual training and machine shop work. The educational adviser of the camp is supervising those who wish to enroll in these classes.

Plans are being prepared to utilize part of the water power in the 12,000 acre lake just at the rear of the camp. The present plans are to build an undershot water wheel and "gear" it to a pump and generator to demonstrate to the boys a concrete illustration of the utilization of water power.

The reaction of the TPO members to the announcement that CCC enrollees may be used to improve forest stands, by selective cutting and thinning, on five acre demonstration plots, was very enthusiastic. TPO Secretaries report that each individual to whom it was mentioned was very anxious to have one of these demonstration plots on his property.

A number of landowners have recently inquired if slash pine seed and seedlings are still available. Several landowners are anxious to reforest part of their farms. The number of seedlings that will be planted in one body vary from 10,000 to 100,000. The diminishing mortality of trees as a consequence of forest fires is giving added impetus to slash pine planting.

The educational program of CCC Camp P-92, Brunswick, Georgia, has been under the supervision of the Supervising Personnel of the Division of Forestry since May 1, 1936. Classes in Radio Mechanics, Civil Engineering, Highway Construction, Auto Mechanics and Music have been held regularly with gratifying results. The subject of Poultry Husbandry has also been taught. The enrollees that have been studying this subject have raised 110 baby chicks to broiler size, thus gaining practical information pertaining to the raising of poultry.

The members of the Agriculture class have at times had the "swell-head," but their five colonies of bees are in good condition for the coming winter.

The camp "string band" has progressed so nicely within the past few weeks that they have been invited to play for a square dance to be held at the Camp within the next few weeks.

LUMBER BULLETIN AVAILABLE

Manual Number 1756 of the Farmers Bulletin Series is entitled "Selection of Lumber for Farm and Home Building." It was written by C. V. Sweet and R. P. A. Johnson, of the Forest Products Laboratory. It can be obtained from the Superintendent of Documents, Washington, D. C. for five cents. No stamps accepted.

STATE PARK NEWS

Forty-three members of SP-13 enrolled in the American Red Cross First Aid Course which began in this camp August 18. This is the largest number ever to be enrolled in such a class, conducted at SP-13.

The Course is being taught by Mr. Vincent, Educational Adviser. Mr. Vincent recently completed the instructor's course conducted at Fort Benning. He holds the Standard, Advanced, Special and Instructor's Cards.

Twelve lessons are included in the course, and will qualify those completing it for the standard card.

When the course now being taught is completed the number of men in the company qualified in the standard course will total more than one hundred.

An advanced course will be started for those who wish to qualify for the standard rating, early in the fall.

HARD LABOR CREEK RECREATIONAL AREA

The Hard Labor Creek Recreational Area is a 6,500 acre project located near Rutledge, Morgan County, Georgia. Two CCC Camps, National Park Service Cooperating, are located on the area. A WPA Project is also located on the area.

CCC Camp Ga. SP-11 has been located on the area, doing construction work since November 1934. A two hundred acre lake site has been cleared, a 60,000 yard earth dam completed, concrete bleeders and spill way constructed. The lake is filled, and motor boats have been purchased by local citizens and placed temporarily on the site.

Considerable soil erosion work has been done on the area by Ga. SP-11 and the WPA. Cabins have been built by the WPA for summer camps, and a beach on the lake is now in the process of construction.

Additional plans for the area call for the construction of a 37-acre lake above the present one, construction of additional group camps, beautification of the entire area, road building and many other features that will make this recreational area one of the most attractive ones in the state.

Thousands of trees have already been planted on the area, in connection with the soil erosion work, with plans for the planting of many more during the coming planting season. Enrollees in the two CCC Camps on the area are gathering seed to be used in the reforestation program.

Many visitors have already visited the area and expressed their approval of the development program as it is being carried on.

The area is open for inspection at all times and visitors are welcome.

THE CAVES OF GEORGIA

GEOFFREY W. CRICKMAY

Few rocks can withstand the destructive effects of weathering over a long period of time. Through the ages, granite, diorite, quartzite, and other massive rocks have been reduced to soft, incoherent soil by decomposition, brought about mainly by ground-water. Ground-water is commonly slightly acid due to small amounts of carbon dioxide picked up from the air and from decaying organic matter. Limestone is the least resistant of all rocks to acid waters, and pure varieties will effervesce in as weak an acid as lemon juice. Of course, ground-water is far less acid than lemon juice but nevertheless it will corrode limestones (calcium carbonate rocks) and dolomites (calcium and magnesium carbonate rocks) if given time enough. So it is that the rocks in most limestone regions display a very characteristic type of weathering whose features are mainly a result of solution rather than erosion, corrosion rather than corrasion. The characteristic topographic forms in these regions include underground drainage, sink holes, bold springs, residual limestone pinnacles, and are collectively referred to as Karst topography from an area of typical development in northern Italy.

Underground drainage is common in some of the limestone districts of Georgia. Gulley Creek in western Crisp county looks like an ordinary surface stream in its upper reaches but instead of flowing into Flint River, as it probably once did, it now peculiarly disappears underground never to reappear. Similar streams are to be found in the northeast of Mitchell county, southern Bartow county, and elsewhere. What happens to the water? It must finally get to the surface and empty into through-flowing trunk streams but generally it does so by emerging as spring water. From the time it enters the ground up to the time it again emerges at the surface, this underground stream accomplishes some interesting work. Every crevice through which the water flows is enlarged, every channel-way is broadened, and every cavernous opening is made bigger by solution of the limestone in the running water. The water, however, dissolves limestone only so long as it remains acid, and when the acidity is reduced by loss of carbon dioxide, calcium carbonate will be precipitated on the walls and roofs of underground passageways. In this way some channels are entirely stopped up and the underground

stream may be forced into other circuitous routes towards its outlet, leaving caverns and tunnels without any stream.

Many very large springs are known in limestone regions because of this easy passage of water through the rocks. And for this same reason, springs in limestone cannot be trusted for purity, for open passageways afford no filtration as do the fine capillary openings in insoluble rocks. Cave Spring in Floyd county, named from a nearby limestone cave, is estimated to yield 3,444,000 gallons per day. Many springs from limestone yield more than 100 gallons a minute.

A sink hole is a more or less circular depression, ranging from a few feet to as much as five miles in width, which may or may not contain water. Sink holes abound in certain sections of Georgia. There are a number near Stilesboro, Bartow county, in Crisp county and elsewhere. Some sink holes are funnel-shaped. Others have nearly vertical walls. One of the most beautiful sink holes in the State is that of Forest Falls, also called Limesink, 8 miles north of Whigham, Grady county. A waterfall here drops 80 feet over vertical limestone walls. The rock is largely calcareous, but includes layers of dolomite and calcareous sandstone. A similar sink probably of very recent origin occurs 11 miles north of Whigham.

Where surface water percolates to considerable depth through limestone rocks it enlarges by solution many small crevices, and a number of irregular and ramifying channel-ways may be developed. In many places these channels expand into large rooms, some of immense size. The water seeping into these caverns brings with it dissolved limestone but, due to loss of carbon dioxide, calcium carbonate is deposited as "icicles" of calcite, called dripstones. The commonest and best known type of dripstones are the stalactite, which grows downward from the cavern's roof, and the stalagmite, which grows upward from the floor. A union of stalactite and stalagmite forms a continuous column extending from roof to floor. The splendor of most caverns is due exclusively to the array of columns and other dripstones which take on the appearance of all manner of architectural forms; "organ pipes", "draperies", "pillars", and statuary figures are common. Some caverns extend to immense depths. The Lookout Mountain Caves near Chattanooga, which probably extend into Georgia, are at least 1300 feet

below the earth's surface. The famous Carlsbad Cavern in New Mexico is nearly 1000 feet deep and includes one room half a mile long and 200 feet wide.

The southern Appalachian region is famous for its limestone caverns, and particularly famous are those of eastern Tennessee and Shenandoah Valley of Virginia. These caverns are lighted so as to effectively show up the dripstones and have been developed as scenic attractions. Georgia also has its limestone caverns but up to the present time none of these has been fully developed. The following is a list of some of the best known caverns in the State. Anyone having information on caverns not here listed would confer a favor by sending detailed information to the State Geologist.

We are accustomed to think of scenery in terms of landscape but the caves of Georgia are an important part of the scenery of the State and as such they deserve development. Anyone who has visited some of the larger caverns in Virginia and elsewhere will be sure that in many respects the wonders of this underground scenery is more awe inspiring than our mountains and our valleys. In many respects caverns are a different world. They are continually dark, are continually cool, and continually the same. Any animal choosing this habitat has to put up with these conditions of monotonous invariability; no day or night, no summer or winter. Thus it is that many cave animals, particularly the bats, are very specially adapted. Their eyes may be extremely acute or they may be blind and in the place of eyes possess highly developed tactile organs. Color is certainly useless in complete darkness and so many cave animals lack pigmentation. If an animal cannot see in the darkness of a cavern it can at least hear, and strongly developed hearing is characteristic of some of these animals which have forsaken the surface of the earth to seek an abode beneath.

Greer Cave: The cave is 9 miles north of Cuthbert, Randolph County, in pure (97.19 per cent calcium carbonate) calcareous limestone, which is quarried nearby as "travertine marble." The cave consists of irregular tunnels which are in places enlarged into small rooms. The entrance is a well-like opening on the southern slope of a small hill from the base of which a bold spring issues. The limestone beds, which are nearly horizontal, are underlain by hard calcareous sandstone.

Ladd Lime Caves: The cave entrances are exposed in the face of a quarry of the Ladd Lime Company about 2 miles southwest of Cartersville, Bartow County. The rock is a dove-gray compact dolomite (analyses indicate 24 to 34 per cent lime, 13 to 20 per cent magnesia.) An irregular and unexplored network of tunnels extend into the hill, enlarging in places into rooms of considerable size. The walls and roof

of the caverns are nearly covered with an adornment of stalactites. It is possible that the Indians knew of these caves for on top of the hill which they penetrate an old Indian fort has recently been discovered. These caves present distinct possibilities for commercial development.

Frick's Cave: The cave, near Cassandra, Walker County, has a large entrance about 15 feet in diameter which leads through a tunnel into spacious rooms containing various fantastic forms of drip-stones. The caverns have not been fully explored. This cave is surrounded by a wooded area, which offers splendid opportunity for development.

Marble Hill Caves: The caves at Marble Hill are in marble and although not extensive they are unusual because of the fine crystalline calcite which can here be collected. Some of the calcite crystals fluoresce a delicate pink color.

Salt Peter Cave: The cave is 3 miles southeast of Kingston, Bartow County. The main entrance leads through a long straight tunnel directly into a low rounded hill. The first large room to be met is locally called the "Ball room" which is 25 feet in width, 60 feet in length, and about 20 feet in height. Connected to the "Ball room" by a narrow passage is the "bat room" so named for the number of bats which frequent the cavern. A tortuous passage leads from the south entrance of the caverns into the "jug room" named because here a bulbous column formed by union of stalactite and stalagmite has the form of a jug. It is said that salt peter was extracted from this cave during the war between the states.

Wilson's Cave: The cave is 1 mile north of Oakton, a station on the Central of Georgia railway, Walker County. This cave is said to include some very striking and beautiful stalactites but has not been fully explored.

Tatum's Cave: This cave is northwest of Wilson's cave near Dry Creek. No accurate description of the cave is available.

Cave Spring Cave: This cave, near the town of Cave Spring, Floyd County, is probably the only developed cave in the State. A small entrance charge is made. The caverns are effectively lighted.

Other caves reported but on which there is no detailed information are at Quitman, Brooks County; Pelham, Mitchell County; Nickajack Cave, Dade County; Rock Cave, Blowing Cave, Grady County; and Indian Den, Lee County. Wilmots Cave, Upson County, and Providence Cave, Stewart County are not true caves, but are sharp, deep gullies resulting from rapid erosion of soils. Small cavernous openings in granite are not uncommon but these do not constitute caves of the type found in limestone areas. Small caves in granite are known on Stone Mountain, DeKalb County, and near Flint River, Meriweather County.

JUNIOR MINERAL INDUSTRIES SCHOOL

The average young man entering college has very little knowledge of what life work he desires to fit himself for and is given little or no vocational guidance to enable him to make an intelligent choice.

Believing that the mineral industries of the Southeast offer an excellent opportunity for employment to well-trained young men, the Department of Ceramic Engineering of the Georgia School of Technology, in cooperation with the Rotary Clubs of Georgia, the Division of Geology of this Department, the Georgia Mineral Society, and the Georgia Power Company, held on August 31st to September 12th a Junior Mineral Industries School. Twenty-four high school graduates from all over Georgia were selected by the Rotary Clubs in their community, who paid part of their expenses to the school.

The first week of the school was devoted to morning lectures on the raw materials and production methods of the mineral industries, followed by afternoon work in the laboratory of the Ceramic Department, making such products as whiteware, brick, glass, and enamel, and by moving pictures of these industries in the evening. On the first morning State Geologist Richard W. Smith spoke on "Opportunities in the Mineral Industries of Georgia." The program on Saturday, September 5, was sponsored by the Georgia Mineral Society and consisted of the following talks: "The Relation of Geology to Ceramic and Chemical Engineering", by Dr. Poole Maynard; "Earth's History", by Richard W. Smith; "Some Common Minerals and Their Identification", by Dr. G. W. Crickmay; and "Mineral Collecting as a Hobby", by Page B. Blakemore, Jr. On Sunday the school made a trip to Stone Mountain and nearby granite quarries under the supervision of Dr. G. W. Crickmay, Assistant State Geologist.

The second week of the school was spent in visiting, by means of a special Greyhound bus, the following mines, quarries, and industrial plants using mineral raw materials:

Tate, Georgia: Georgia Marble Company.

Cartersville, Georgia: New Riverside Ocher Company (mining ocher and barite); The Georgia Art Pottery.

Dalton, Georgia: Dalton Brick and Tile Company.

Chattanooga, Tennessee: Chattanooga Glass Company; Samuel Stamping and Enameling Company.

Daisy, Tennessee: B. Mifflin Hood Company (manufacturing roof, floor, and structural tile, acid rings, and brick).

Birmingham, Alabama: Harbison-Walker Company (manufacturing refractories); American Cast Iron Pipe Company; Alpha Portland Cement Company.

Dry Branch, Georgia: Georgia Kaolin Company.

Macon, Georgia: Carling Tile Company (manufacturing bathroom type of floor and wall tile); Cherokee Brick Company (manufacturing brick and structural tile).

The State Geologist accompanied the school on its inspection trip. The boys selected by the Rotary Clubs were without exception of the highest type and eagerly absorbed the information offered them. It is not to be expected that all of the boys will eventually enter mineral industries but even those that will follow other lines have gained a knowledge of the mineral resources of Georgia and adjoining states that will be of value to them and will make them more valuable citizens. Too few Georgians know the extent or the importance of Georgia's natural resources.

Prof. W. H. Vaughan, Acting Director of the Department of Ceramic Engineering is to be congratulated on arranging this very successful school. It is to be hoped that the school will have an even better attendance next year. Some provision should be made for extending the privilege of the school to deserving boys in communities in which there are no Rotary Clubs.

—R. W. Smith.

FLUORESCENT EXHIBIT AT SOUTHEASTERN FAIR, ATLANTA

The Division of Geology will have an exhibit of fluorescent minerals on display in the Educational Building, booth 7, at the Southeastern Fair, Atlanta, October 10 to 11. The exhibit will include all the fluorescent minerals of Georgia and man from as widely separated places as California, Quebec, and England. In addition there will be a number of artificial substances which are even more brilliantly fluorescent than most minerals. Surrounding the fluorescent display there will be a number of educational panels showing the distribution of commercial minerals in the State. Two panels will show various products made entirely or in part from kaolin and bauxite, minerals which occur extensively in Georgia. A guide will be on hand at all times to give information on Georgia's mineral products. We believe the exhibit in booth 7, Educational Building, is well worth seeing when you are at the Fair.

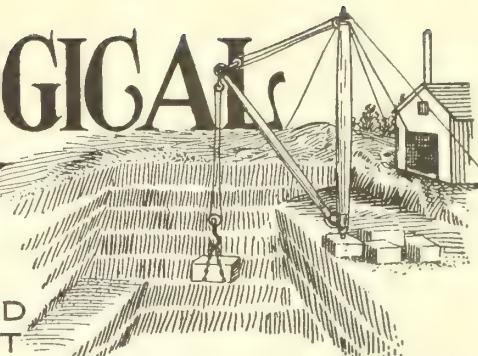
VALUABLE BULLETIN AVAILABLE

"Georgia Land Use Problems" by W. A. Hartman and H. H. Wooten is the title of Bulletin 191 of the Georgia Agricultural Experiment Station, Experiment, Georgia. This bulletin treats of soil types, erosion, forests, topography, and all other factors affecting the economic use of Georgia land. This bulletin is available at no cost to citizens of Georgia upon application to H. Stuckey, Director, Experiment, Georgia.



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No. 11

TIMBER PROTECTIVE ORGANIZATIONS IN GEORGIA INCREASE ACREAGE DURING RECENT YEARS

MORE ACREAGE SHOULD BE PROTECTED—RECORDS SHOW FEWER FIRES ON PROTECTED AREA THAN ON UNPROTECTED AREA

The area of forest lands in Georgia under organized protection from fire has grown from less than one million acres in 1926 to approximately five million acres in 1936. This increase in the numbers of acres being protected in a systematic manner is due mainly to the efforts of those interested in the conservation and protection of the forests in Georgia calling the attention of others to the great damage being done annually by the "great enemy" of the forest—FIRE. The damage done to the forest each year by fire amounts to more than five million dollars.

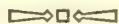
As a comparison of the number of acres burned annually on the protected area and the unprotected area, with the estimated damage in dollars and cents to each, we are giving the fire statistics for 1934. During this year there was a total of 25,761 fires reported, burning 5,469,409 acres. Number of fires on acres of the Timber Protec-

ment has appropriated moneys to be used in assisting private forest landowners in their efforts to protect growing trees from fire. In order to be eligible to receive aid from the Federal Government, timber owners must belong to a Timber Protective Organization. Any timber owner within the state may belong to one of these organizations.

A private landowner who wishes to obtain the aid of the State and Federal Government in forest fire control, may join with two or more private landowners to form a Timber Protective Organization.

The aggregate of their combined forest lands must exceed 10,000 acres, these lands must be contiguous so that they may be readily and economically handled as an administrative unit. The several landowners should then make application through the district forester for recognition as a Timber Protective Organization. The

HELP INCREASE THE TPO ACREAGE IN GEORGIA



PROTECT THE WOODS FROM FIRE

ive Organization was 1,711, burning over 345,409 acres, with an estimated damage of \$413,409. The percentage burned in the protected area was .08 per cent. The number of fires on the unprotected area amounted to 24,050, burning more than 5,000,000 acres and doing an estimated damage of more than \$5,000,000. The percentage of the unprotected area that was burned was 27 per cent.

Realizing that the control of fire in the forest lands of Georgia is vital to the welfare of the private landowner, the counties, the state and the nation, the U. S. Govern-

State Forester will send a representative to confer with the interested landowners. If the application meets with the approval of the State Forester, the landowners will be notified and then should form a permanent Timber Protective Organization.

After the approval of the request has been received from the State Forester, the interested landowners should call a meeting for the purpose of organizing the Timber Protective Organization. The members present at the meeting shall define the boundaries of the TPO territory, selecting

(Continued on Page 6)

IMPORTANT DISCOVERY MADE RECENTLY BY DR. HERTY

UNCOVERS MORE SOURCE OF WEALTH IN THE PINE TREES OF THE SOUTH

Working in The Paper and Pulp Laboratory recently, Dr. Chas. H. Herty made another valuable discovery, that of "fat" in pine trees, "fat" containing the same stuff as human and animal fresh.

The handicap to making book paper was what the paper industry calls "pitch." It is the stuff which shows as an occasional slightly discolored spot in paper. It is not pitch, but Dr. Herty said no one knew exactly of what it was made.

To find out, he sliced sections of tree wood thin as tissue. He colored the slices with biological stains like a physician looking for the cause of disease. The result was discovery that the "pitch" was made of what botanists call "ray" or pasynchremous cells. These are the "living" parts of the wood, which a few years ago would have been identified simply as "protoplasm."

Chemical analysis showed they were filled with fats, fatty acids and waxes. These cells are visible only under a microscope. They are many times smaller than the tree fibers which make paper. They are extracted by diluting the pulp and letting it run by gravity over a porous screen. The small cells fall through with the water. There is no machinery. At the end of the downgrade Dr. Herty has a new type of pulp, more free from the fat than even the spruce pulps now used for the best grades of paper. Another new process separates the water from the fat.

Spruce trees, Dr. Herty stated, contain only about 1½ per cent of the fats. The southern pines all contain much more of the living stuff, which probably accounts for them growing nearly five times as fast as spruce. One of the southern pines, loblolly, has eight per cent of fat.

"If," said Dr. Herty, "all the sulphite pulp (the newsprint pulp) used in this country annually were made from southern pines it would mean a daily production

(Continued on Page 5)

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

NEW DISTRICT FORESTER APPOINTED

OFFICE AT MACON OPENED OCTOBER FIRST

Herbert C. Carruth, of Roswell, Georgia, has been appointed District Forester for the Fifth District, with headquarters in the Chamber of Commerce Building, Macon, Georgia. Mr. Carruth assumed his duties on October 1. Miss Mildred Wood, of Barnesville, Georgia, was appointed Secretary to Mr. Carruth and will be in the office.

Mr. Carruth is well qualified for the position, having received his degree in Forestry from the School of Forestry, Athens, Georgia, in June, 1936. During his study of forestry he made an unusual record in all of his work.

NEW SECRETARY TO STATE FORESTER APPOINTED

At the Quarterly meeting of the Commission of Forestry and Geological Development, held October 15, Miss Hazel Nicholas, who was Secretary to the State Forester, was appointed Treasurer and Bookkeeper for the Department. Mrs. John Y. Roberts was appointed by the State Forester to take Miss Nicholas' position as Secretary. Mrs. Roberts assumed her duties October 19.

ELLIOTT W. REED, TIMBER OWNER GIVES FINDINGS ON PINE SEEDLINGS

PATENTED SEEDLING LIFTER IN SLASH PINE TRANS- PLANTING AFFORDS BETTER RESULTS

We have recently received from Elliott W. Reed, of Chatham County, a detailed report of his experimentation of slash pine seedling transplanting and two proposed acreage operation plans. The former contains comparative records of the use of the old hand shovels and the new patented seedling lifters through the months from March, 1935 to July, 1936, on groups transplanted monthly with counts taken in February and July. Attached were daily weather conditions from the United States Government reports.

Mr. Reed shows, on his July count on groups of 50 seedlings transplanted monthly from March, 1935 to February, 1936, by use of the new patented seedling lifters, an increase of 7.4 percent living plants over the 25 group transplanted with the old hand shovels under the same period plan from August, 1935 to July, 1936. All seedlings, regardless of the method used, that

were transplanted in the fall and the early winter months, with the exception of those in December, survived 100 percent. The 8 percent loss of the December group was probably due to the extremely low temperature and lack of adequate rainfall.

From January 5, to March 1935, Mr. Reed transplanted 66,915 seedlings in Chatham County. 11,368 of these were lost. With the remaining 55,547 trees he proposes two 73.5 acre operations, based on 2 and 15 year rotation plans. Allowing for expected decrease during the rotation period, the seedlings would yield an average of 704 trees per acre with which to operate.

The 26-year rotation plan includes pulpwood, naval stores, and saw timber consumption. It recommends thinning of trees for pulpwood at the end of the 10 and 15th years, turpentineing the rest of the remaining 10 years, and at the end of the 25th year discontinuing the naval store operations and cutting the trees for saw timber. The 15-year rotation plan includes only pulpwood operations. All amounts received from both plans to be carried forward the remaining years of each period with 6 percent interest, compounded annually.

The following figures show the income and compiled expenditures to be expected from these plans:

73.5 ACRE OPERATIONS OF TRANSPLANTED SLASH PINE SEEDLINGS

Based on 26-Year Rotation including Pulpwood, Naval Stores, and Saw Timber
INCOME

10th year	352 trees per acre cut for pulpwood.....	\$1,212.75
15th year	235 trees per acre cut for pulpwood.....	1,617.00
Last 10 years	117 trees per acre turpentineed.....	3,439.80
End of 25th year	117 trees per acre cut for saw timber.....	4,300.00

Amounts compounded annually at 6%.....\$15,256.50

EXPENDITURES

Land Investment, Planting, Fire Protection,
Supervision and Taxes.....6,458.50

PROFIT

Based on 15-Year Rotation including only Pulpwood

INCOME

10th year	808.5 cords @ \$4.00 per cord.....	\$ 3,234.00
Compounded annually @ 6% for 5 years	1,121.75
15th year	1,617 cords @ \$4.00 per cord.....	6,468.00

Total.....\$10,823.75

EXPENDITURES

Transplanting, Cutting, Hauling, Land Investment and Miscellaneous Expenditures.....8,147.00

Profit

\$ 2,676.75

TALLEST TREE IN THE WORLD

"The Redwood Empire Association has established definitely that the tallest tree in the world grows within the redwood empire.

"The tree is the 'Founder's Tree', a

great redwood in Bull Creek Flat, near Eureka, Humboldt County, California. It is 364 feet high.

"Only one other tree is known to have exceeded this height. This was an eucalyptus at Victoria, Australia, which attained a height of 375 feet. According to existing records that have just been brought to light, it was destroyed in 1880."

"The Timberman"

AGE DISTRIBUTION OF CCC ENROLLEES GIVEN

LARGEST PERCENT BELOW TWENTY YEARS OF AGE

Robert Fechner, Director of Emergency Conservation Work (CCC), recently made public the results of a survey conducted by the Department of Labor to determine the age distribution of 238,846 young men between the ages of seventeen and twenty-eight who were selected for enrollment in the Civilian Conservation Corps between October 1, 1935 and July 31, 1936. This survey, covering the selection of all young men enrolled in the CCC since the minimum age limit was set at seventeen years, showed that more than one-half of the men came from the seventeen- and eighteen-year age groups. The survey also disclosed that 75 percent of the 238,846 men selected were in the seventeen-, eighteen-, nineteen- and twenty-year age brackets. Not more than 17.22 percent of the applicants for enrollment were above twenty-one years of age when selected.

A copy of the survey forwarded to Director Fechner follows:

Age	Number Selected	Percentage of Age Group to Total Selected
17.....	62,017	26.00
18.....	61,725	25.87
19.....	33,711	14.11
20.....	22,876	9.57
21.....	17,291	7.23
22.....	12,289	5.14
23.....	8,993	3.76
24.....	6,735	2.81
25.....	4,965	2.07
26.....	3,422	1.43
27.....	2,805	1.17
28.....	2,017	.84
TOTAL	238,846	100.00

LARGE INCREASE IN FARM WOODLANDS

REASONS FOR INCREASE GIVEN BY U. S. FOREST SERVICE

A large increase in woodlands on farms is shown by the 1935 Census. The increase of 23.7 percent, or 35,529,240 acres, during the 5-year-period of 1930 to 1935, brings the total area of farm-woods up to 185,474,965 acres.

Some reasons for the increase are known, according to W. R. Mattoon who is conducting the present inquiry on farm woodlands, and others may become apparent later.

In order to be included in a Federal Census it is necessary that farms be in active operation or "going" farms. During the peak of prosperity culminating in 1929,

many farms were either abandoned or became inactive, with the result that a large area of "farm" woodland was not included in the 1930 Census (reporting conditions of 1929). The depression with its well-known "back-to-the-farm" migration from industrial centers revived many inactive farms or established new ones, located more generally in regions of less fertile soils or rougher topography with relatively large amounts of woodland. Thus, the 1935 Census (year of 1934) included large areas of woodland that technically did not exist in 1930 as farmwoods.

There has been a general shift in land use from cropland to pastureland and from worn-out pastureland to woodland, or even direct from cropland to woodland. The recent agricultural soil conservation program has resulted in the extensive planting of soy beans and other soil-building legumes for intensive pastures with an accompanying abandonment of low-grade former pastures, many of which had considerable tree growth.

In selecting new farms there is good evidence that people quite generally seek lands having timber growth which will furnish materials needed for buildings, posts and fuelwood, and also some cash from the sale of various forest products.

CCC ENROLLEES FIGHT FOREST FIRES

MANY DAYS SPENT ON FIGHTING DUTY TO HELP CONTROL FIRES

As forest fire fighters, the men of the Civilian Conservation Corps have expended more than 3,000,000 man-days on emergency forest fire fighting duty in the nation's forests and parks since the corps was initiated in the spring of 1933, Robert Fechner, Director of Emergency Conservation Work, announced today.

"The unusual severity of forest fires in many sections of the country this year, climaxed by the recent disastrous fires on the Oregon coast and in southern Washington and California, placed especially heavy responsibilities upon government and state officials charged with the responsibility of protecting our forests and parks from destructive fires", Director Fechner said. "As a result, the CCC was called upon for large numbers of men to fight fires. Since early spring, when serious fires in the South inaugurated the current season, there has not been a month when the CCC has not been called out in considerable numbers to fight fires, many of them of major proportions.

STOP WOOD FIRES

EDUCATION STRESSED IN CCC CAMPS

ENROLLEES TAKE ADVANTAGE OF INSTRUCTION OFFERED

According to an announcement made recently from the office of the Director of the Emergency Conservation Works, Washington, D. C., approximately 40,000 illiterate enrollees in the Civilian Conservation Corps have been taught to read and write through the camp educational program since the beginning of the corps, Howard W. Oxley, Director of CCC Camp Education, stated recently in a report forwarded to the War Department and transmitted to Robert Fechner, Director of Emergency Conservation Work.

Reduction of illiteracy has been one of the major objectives of the educational program in the camps, and men entering the corps unable to read and write have been encouraged to participate in classes arranged for illiterates. Mr. Oxley reported that, at the end of the 1936 fiscal year, 92 per cent of the 7,595 illiterate enrollees enrolled at that time were learning to read and write. This figure compares with the 88 per cent of the illiterate enrollees who were participating in classes in reading and writing at the beginning of the fiscal year.

"An analysis of the educational level of the CCC enrollments reveals that approximately 2½ per cent of the men are illiterate when they enroll", said Mr. Oxley in this report. "Naturally, elimination of illiteracy has been considered one of the primary objectives of the educational program."

INTERESTING FOREST FACTS:

For many centuries the camphor tree was the principal ornamental tree used in temple courtyards of Japan and China.

The ginko tree would be extinct today had it not been for the perseverance of an early Chinese Priest who planted these trees in the temple courtyards.

American hickory is used extensively in Switzerland for the construction of the best skis.

Ox teams of six and eight are being used to haul logs to the four sawmills on a logging operation of about 40,000 acres of virgin timber near Shawneetown, Illinois. It was necessary to import oxen because of the swampy area being logged.

The weekly payroll of the lumber industry is \$9,000,000, giving employment to over 510,600 men.

FOREST

C. C. C. CAMP NEWS

P-62.

The sweetwater creek bridge located between the southern Industrial Orphans' Home and Red Oak School is being painted by Foreman L. C. Outler, Leader Theron Aldridge and crew.

This bridge has been under construction for the past two and a half months and is nearing completion.

Foreman C. C. Beecher, Leader Raymond Thomas, and crew are building a log fence around the Hartfield Tower, located in Jeff Davis County.

The construction of the two steel towers to be erected during the eighth period will begin soon.

One is to be located in the vicinity of Surrency, Appling County, and one in the vicinity of Mershon, Pierce County. We are looking forward to Mr. Watts and his crew doing the job.

Truck Trail No. HC-B-701, located in Bacon County, under the supervision of Foreman G. F. Womble, is progressing very rapidly.

With leader J. D. Gibbs and crew, Mr. Womble is doing some very fine work. Leader J. H. Brant is operating two Euclid Scrapers.

It wouldn't be right not to mention Foreman A. L. Sutton. He is not assigned to any one particular "job" but is known as "The Jack of All Trades," such as, tractor operator, telephone line construction, truck trail construction, bridge construction and the like.

We are very glad to have Inspector J. H. Stone from the Regional Office and Inspector R. S. Thompson from the Atlanta Office with us last week. They were inspecting everything in general and found everything satisfactory.

Supt. H. C. Brown has been very busy inspecting the work which has been done during the past month.

P-68.

P-68 DETECTION AND COMMUNICATION SYSTEMS

Lookout towers have been constructed at Denton and four miles west of Pridgen on the Coffee and Ben Hill County line. These towers are connected by telephone with the towers at Chatterton and Forky Creek. They are so located as to form a square that will provide a detection system from

the Ocmulgee River to the Satilla River on the north and south and into Bacon County on the east, as well as the eastern portions of Ben Hill and Irwin Counties on the west.

The detection system of this TPO is connected to that of the Appling TPO by a telephone line from Denton via the Bouie Tower into Baxley. A line has been built from the Pridgen Tower into Fitzgerald with a spur into Wray.

Camp Lanier's Educational Building has received several improvements lately. The interior has just been painted in bright white and green colors. This increases the lighting effect and brightens the appearance for the coming winter evenings.

The Reading Room, with its ample magazine racks, a writing desk and a large reading table, gives a welcome to one entering the building. Adjoining is the Library and the Adviser's Office, where many enrollees stroll in for a chat. Our Library of six hundred volumes affords many hours of pleasure and recreation to many readers.

The promise of the Education Department for this winter is to provide the warmest, most attractive, comfortable and inviting places about the Camp.

P-87.

Plans are being made at P-87 to spend a great deal of time during the winter months in installing the nucleus of what we hope to make a complete fire detection system for Floyd County. This is in line with the County-wide TPO which the action of the Floyd County Board of Commissioners has made possible by their agreement to pay acreage assessment on all County timber lands. Indications are that this action is the initial move that will bring all of Northwest Georgia into an effective protective unit and that it will be of vast timber benefit in the watershed of the Coosa, the Oostenoula and the Etowah rivers.

The present plan calls for the installation of two steel lookout towers and approximately fifty miles of telephone line, as well as some six or eight miles of truck trail.

P-92

SHORTAGE OF PINE CONES

The crop of slash and longleaf pine cones in Glynn and nearby Counties was particularly small this year. Camp P-92 had great difficulty but managed to gather the allotted 100 bushels of slash pine cones but was unable to obtain any of its longleaf cone allotment. The whole of Glynn and part of Brantley, Wayne and McIntosh Counties were covered in the pine cone search and the crop is reported extremely small.

EDUCATIONAL WOODWORKING SHOP

An object of pride to Camp P-92 as a whole and especially to the carpenters and woodworkers of the Camp is the recently completed woodworking shop. Large and roomy with ample space to install the jig saw, band saw, rip saw, lathe and jointer purchased out of educational funds, this building will prove very valuable to a large group of boys. Already various articles made of cedar which show talented workmanship have been completed.

BRUNSWICK PULP MILL

Timber growers of Glynn County, Camp P-92, and all other agencies interested in the growth and conservation of the pine lands of this section are greatly interested in the plans to construct a seven million dollar pulp mill in the City of Brunswick. Work on this plant has already been started.

ANNUAL STATE F. F. A. CONVENTION HELD IN MACON

MORE THAN FIFTEEN HUNDRED MEMBERS ATTEND

The Eighth Annual State Convention of The Georgia Association of Future Farmers of America was held at Macon, Georgia, October 22, 23, 24, with more than fifteen hundred students and teachers attending.

The convention was held in conjunction with the Georgia State Exposition, which organization sponsored and financed a number of contests for the vocational students. Some of the contests that were held during the convention were Dairy Judging, Swine Judging, Seed Identification and Plant Judging, Shop Judging, and the Identification of more than twenty species of forest leaves.

Carl Maxwell, Bowman High School, President of the State organization, presided at all the meetings.

At the closing session of the convention Saturday morning, Miss Emily Woodward, a member of the Executive Committee of the Georgia Forestry Association, awarded a cash prize of five dollars to each of the following vocational students who had written the five best articles pertaining to their school and home forestry project:

1. Myrvin Clark, Sale City High School
2. Tommy Ginn, Bowman High School
3. John Beggs, Hartwell High School
4. J. Vern Stancil, Clarkesville High School
5. Everett High, Sale City High School

These students have not only written good articles pertaining to their forestry work at home and at school but have done excellent work in their forestry projects.

T. P. O. NEWS

OGEECHEE TPO GIVEN POLICE PROTECTION

CHATHAM COUNTY OFFICERS COOPERATE TO PROTECT WOODS FROM FIRE

In order to protect the forest more adequately from fire during the coming season, the Police Department of Chatham County has detailed two of their regular force for special fire protection and enforcement of the law regarding forest fires, according to an announcement made recently by Elliott W. Reed, President of the Ogeechee Timber Protective Organization.

W. F. Chapman, Chief of the County Police Force, has assured the members of the TPO that two members of the Police Force are ready at all times to give special attention to fire calls.

Chief Chapman said, "We are anxious to enforce the law, and we are going to do everything in our power to help keep down fires. We mean business!" He stated that police headquarters now had direct telephone connections with the look-out stations in the field and a man could be put on the job in any part of the county within fifteen minutes after receiving a call.

In addition to the telephone connection with police, which will bring their aid, Mr. Reed said they had more rangers this year and better equipment. He said they were going after those persons who burned the woods, either maliciously or carelessly, stronger than ever.

Those persons caught violating the law in regard to starting fires will be prosecuted. According to Georgia law, the offense is held as a misdemeanor and carries a penalty of \$1,000 or six months in prison.

To illustrate the progress in fire prevention, which they are making on their holdings, Mr. Reed said during the year 1934-35, when they had 105,000 acres listed in the organization, they lost by fire, 3,921 acres, but last season, when they had over 135,000 acres listed, they lost only 1,233 acres.

Other agencies of the county are also cooperating with the TPO in protecting the forests from fire. The Judges of the Courts of the county, the County Commissioners, the members of the CCC Camps and the Grand Jury are doing all in their power to cooperate in this important undertaking. The Grand Jury has a Timber Conservatory committee, which has made special recommendations through the en-

tire body regarding timber conservation and protection. Judge Rourke, of the Superior Court, has been specific and generous in his charge to the Grand Jury, from time to time, regarding forest fires, timber conservation and reforestation. Judge Arthur Solomons, Chairman of the County Commissioners, has agreed to cut a strip clear of all growth 30 feet wide on either side of the roads in the county, to afford protection from tourists.

The Ogeechee TPO is very fortunate in securing cooperation from the agencies mentioned above. With it we predict that fewer forest fires will occur during the coming season than ever before. We wish to congratulate them and other TPO's of the State on the splendid work they are doing along these lines.

GASKINS T. P. O. BEGINS FOREST PROTECTION

Realizing that they have a great advantage over other sections of the state the members of Gaskins T. P. O. are making preparations for the protection of their timber land during the coming fire season. In getting aid to carry on this type of protection we are getting the best encouragement that any industry could ever hope to receive.

Berrin County was slow in practicing timber conservation, and fire protection, but the people are aware of the fact that if they do not do something to protect the forest it will not be long until they will be practically destroyed.

VALUABLE NAVAL STORES BULLETIN AVAILABLE

PRODUCERS SHOULD SECURE THIS PUBLICATION TO GET THE LATEST INFORMATION

The U. S. Department of Agriculture has just released an interesting publication entitled "Variations in Naval Stores Yields Associated with Weather and Specified Days between Clippings."

The data contained in this booklet was collected by Messrs. V. L. Harper, silviculturist, and Lenthall Wyman, formerly associate silviculturist, of the Southern Forest Experiment Station, U. S. Forest Service.

The introduction to the contents and the explanatory matter relating to the statistical data are clear and concise, and the information will undoubtedly be of service to all naval stores operators who avail themselves of a copy.

The booklet is listed as Technical Bulletin No. 510, the cost is five cents, and copies can be had by addressing the Superintendent of Documents, Washington, D. C.

STATE PARK NEWS

SP-13

Members of Company 4463, Chipley, Ga., have recently started a poultry project as a supplement to a class in Poultry farming, which is a part of the regular scheduled educational course.

A dozen White Leghorn hens were secured by the Educational Adviser and the enrollees assisted in constructing a six by eight foot model house on the camp grounds. The hens will provide a working laboratory for the enrollees taking the course to get first-hand information on culling, feeding, housing, sanitation and marketing.

Motion pictures showing best practices in caring for flocks were shown in the Camp soon after the arrival of the hens. These pictures stimulated an interest in the class and those enrollees taking the course are doing so with a view to making poultry a part of their farming activities when they leave the CCC.

Following the close of the summer session, twenty-two members of the company were awarded certificates for completion of courses in the Camp educational department.

The certificates were awarded following the completion of courses in Business Arithmetic, Typing, Citizenship and Government, and Business English. The course in business arithmetic was taught by the camp Educational Adviser and covered a period of eight months. The course in Citizenship and Government covered a like period and was conducted by Lt. Leigh during his six months tour here as Commanding Officer. Following his relief, the course was carried on by the Educational Adviser and later by Robert Pendley, technical student from Emory University who spent the summer in camp.

DISCOVERY OF DR. HERTY

(Continued from Page 1)

of fats and waxes of about 420,000 pounds. None of these fats are now being extracted here or elsewhere."

Getting rid of the fat in trees has been also a big stride ahead for another of Dr. Herty's scientific "dreams," the making of clothing from southern pine forests. The fat in these trees has been a barrier to making rayon.

Preliminary tests of the "fatless" pine wood indicates that it will make standard rayon.

SIXTH DISTRICT

**W. G. Wallace, Dist. Forester,
Savannah**

A recent inspection of the 1500 acre tract of Dr. Julian Chisolm of Savannah showed excellent results of land planning. While maintained primarily as a game preserve, this tract is being managed in such a way as to make the forests productive as well as the cultivated section of the farm. All old fields are being rapidly planted with slash pine seedlings produced by the State Nursery at Albany. Where wooded areas are not properly reforested, interplantings are being made to make the forest productive.

And of course the all-important steps necessary to good fire protection are being taken. As a game preserve must be managed properly in order to have the wild game desired, numerous small patches of feed crops for quail, turkey, doves, deer, etc., are established throughout the tract. The nearby forest offers the necessary cover for game. Much cover and feed crops are left in the larger cultivated fields on the farm by skipping patches of peas, beggar weed, etc. An old rice field is being developed into a duck pond. That results are being gained both as to forests and wild game was readily noticeable. Wild turkey ran out of pea fields ahead of us, and much evidence of deer was there.

The point is, your land will pay better if you manage it properly and develop the many products it is capable of producing.

The County Commissioners and people of Candler County, county seat of which is Metter, have indicated their interest in the business of protecting growing timber by purchasing a 100 ft. steel lookout tower which is being erected by the CCC.

Many excellent stands of Slash and Longleaf Pine are to be seen in this County which also has much valuable farm land. Our heavily timbered Counties have much to boast of but on the whole a county such as Candler, having excellent farms as well, will find many advantages in the matter of raising and marketing timber and forest products. That Candler County will recognize this opportunity and will carefully plan the protection and development of its forests and forest areas we have little doubt.

Now that the time has rolled around again for firebreak construction, we find that there are six T. P. O. in this district owning tractors and firebreak equipment and that most of these are now at work. It is apparent that many of the T. P. O.'s are having their financial troubles thru lack of cooperation among members, but the outlook is encouraging, and we hope that a better spirit of cooperation will be manifested by the lagging T. P. O. members.

T. P. O. ACREAGE INCREASE

(Continued from Page 1)

natural fire barriers, such as roads, streams, etc., where possible. Membership in a TPO shall be limited to landowners or their representatives who own lands lying within the boundaries of the organization. Landowners wishing to join the TPO after it has been organized may do so upon application to officials of the organization. The TPO's are self-governing.

Georgia has some 22,000,000 acres of potential forest land that is either growing trees or nothing. It is too steep, too stony, too poor, or too far from market to be used for plow land at the present time; and while the demand for food and clothes by an increasing population may in time require that some of this land be put under plow, it is not likely that there will be a great reduction of the forest area for fifty years to come. In the meantime, the demand for forest products, such as lumber, pulpwood, turpentine and rosin is so great that the growing of forests is the most profitable use that can be made of this land. This forest area, if protected from fire and put under proper forest management is capable of maintaining an industry that should contribute at least \$75,000,000 annually to the wealth of Georgia. Such an industry deserves protection and encouragement both from the State and the individual. The larger per cent of these 22,000,000 acres will reseed naturally if forest fires are kept out. The remainder, consisting of old fields, badly burned hill-sides, and clear cut areas which have no seed trees due to repeated fires, must be restocked artificially. Again, the rate of growth on the protected areas, where the litter and humus has accumulated due to the absence of fires, will be more than double that on the area where annual fires occur.

**SOUTHEASTERN PLANNING
CONFERENCE**

State Geologist Richard W. Smith attended the second annual Southeastern Planning Conference held at Jacksonville, Florida, on October 12th and 13th to discuss regional, state, and county planning in the states of South Carolina, Georgia, Florida, and Alabama. One of the features of the meeting, which was called by Mr. Henry T. McIntosh, Albany, Georgia, District Chairman of the National Resources Committee, was a talk by Governor-Designate E. D. Rivers of Georgia. Governor-Designate Rivers said that "planning is so necessary that it needs no advocate," and promised his support for the necessary legislation to establish a State Planning Board for Georgia.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

T. P. O.

All TPO's in this District submitted substantial quarterly statements of expenditures and the sum total of all expenditures for this quarter exceeded \$21,000.00. The majority of the TPO's bought new equipment for plowing secondary breaks and maintaining ECW breaks at the beginning of the fiscal year and these purchases ran the expenditures rather high for the first quarter.

Nearly every TPO is hard at work plowing secondary fire-breaks, maintaining ECW breaks and getting their tower and telephone system in good condition for the coming fire season.

**TPO DAY DECLARED DURING
FESTIVAL**

Friday, November 13, has been declared TPO Day in connection with the annual Forestry Festival to be held in Waycross during the week November 10th thru 14th.

On this day all TPO members and officials will gather in Waycross to look over the exhibits at the Festival and to witness one of the greatest field demonstrations ever to be held showing the uses of every known kind of fire-fighting tools, plows, tractors, and all other tools in any phase of woods work.

Also on this day every one that is a timber land owner will have the opportunity to join some TPO and the blanks will be on hand in the Festival building for everyone caring to sign up.

This TPO Day will be for every State caring to take part and does not mean only the TPO's in Georgia but all protective organizations or units from any State.

Manufacturers of tools and equipment have already been contacted and will have exhibits in the building as well as take part in the field demonstrations.

INTERESTING FOREST FACTS

The following was noted in the "Keep Up With The World" column in Collier's magazine this month:

"A unique association in the South is the Live Oak Society and the membership consists of one hundred giant oak trees. To be a member a tree must be very old, having a legal representative, adhere to the Constitution and By-Laws and pay annual dues of twenty-five acorns. The Secretary is a gentleman in LaFayette, Louisiana, and the President is a large tree on a farm near New Orleans."

By Norma W. Emerson,
Winter Garden, Fla.

TALC DEPOSITS OF GEORGIA

Reported by THE DIVISION OF GEOLOGY

GEOFFREY W. CRICKMAY

Talc is best known in the finely-ground form of talcum powder, which is made almost exclusively from this soft white mineral. Talc, however, finds its way into more than fifty industries and has somewhat more than a hundred distinct uses. The present United States production of talc is inadequate to meet domestic demands, and therefore the talc deposits of Georgia hold more than ordinary interest. This article is a brief review of the talc industry of the State which for more than fifty years has maintained a steady production ranging from 500 to 6000 tons annually, with average value of about \$11.00 a ton.

Talc is a white, green, to dark greenish-gray mineral with greasy feel. It is a hydrous magnesian silicate ($\text{H}_2\text{Mg}_3(\text{SiO}_3)_4$) and is thus chemically closely related to serpentine, chlorite, olivine, and pyroxene, with which it is commonly associated. Its physical properties are similar in many respects to mica and pyrophyllite, and these two minerals have frequently been used as substitutes for talc. Sericite in Pickens County and chlorite in Cherokee County have locally been called talc for many years. Most acids and alkalis have no appreciable effect on talc. The mineral when heated is unchanged until at a high temperature it fuses to a white enamel. Rock made up mainly of talc is called soapstone which, on account of its softness, can easily be sawed and cut into desired shapes.

The talc deposits of Georgia are restricted to the northern part of the State. The most important deposits are in Murray, Fannin, Gilmer, and Cherokee counties. Talc of good grade but probably not in commercial quantities is known to occur in Habersham County, 1 mile west of Soque; Rabun County, 3 miles northwest of Burton, on a small branch of Dick's Creek; Towns County, 5 miles north of Young Harris. Soapstone deposits are known in Carroll, Cherokee, Columbia, Dawson, DeKalb, Douglas, Elbert, Greene, Gwinnett, Habersham, Harris, Heard, Jasper, Lincoln, Lumpkin, Meriwether, Monroe, Paulding, Putnam, Stephens, Union, and White counties.

All the talc now mined in Georgia is obtained from deposits on Fort and Cohutta mountains near Chatsworth, Murray County. Three companies are now active, and all have their mills at Chatsworth:

Cohutta Talc Co. (F. F. Farrar—Dalton, Ga.)

Georgia Talc Co. (J. Frazier Glenn—Asheville, N. C.)

Southern Talc Co. (W. B. Hartsfield—Atlanta, Ga.)

The talc occurs in dark phyllite, schist, and quartzite which strike northeast and

pits were sunk, and consequently practically all the deposits cropping out at the surface were discovered. Early mining was carried on by small open cuts and short drifts in the outcrop, and thus only the yellow, weathered mineral was obtained. Today the mines extend to considerable depth. They have passed through the easily accessible yellow talc and now only the fresh grayish-green talc is mined. Impurities found in the talc as minute grain include magnetite, pyrite, dolomite, chlorite, and serpentine. An average of three analyses of pencil-grade talc from the mines of the



Bagging ground Georgia Talc.—Southern Talc Co., Chatsworth, Ga. Photo Courtesy Southern Talc Co.

dip southeast at an angle of 45 degrees or less. The deposits are present at several horizons in the phyllites. Although they occupy sheet-like bodies like beds of sedimentary rocks, it is generally thought that they represent the alteration of some basic igneous rock. The contact between the talc-bearing rocks and the phyllites is generally sharp. The talc layers range in thickness from 5 to 50 feet and can be traced for hundreds of feet along their strike.

Soon after talc was first discovered in the Chatsworth district, dozens of shallow

Cohutta Talc Co. and Georgia Talc Co. show the following:— silica—60.15; iron oxide—5.14; magnesia—28.71; combined water—4.11; minor constituents—1.57; total—99.59. The high iron content is objectionable for some uses, particularly in the ceramic trade. Iron contained in magnetite and pyrite could easily be removed for these minerals are much heavier than talc, but the iron contained in chlorite is much more difficult to get rid of for chlorite has much the same physical properties as talc. Only a very small part of the talc mined at Chatsworth is used for pencils;

most of it is ground to minus 200 mesh and bagged for shipment for use in the rubber, roofing, bleachery, foundry, and other trades.

The talc deposits of Fannin and Gilmer counties, which have been mined to a very limited extent, are associated with marble and are a southern extension of the talc deposits near Murphy, North Carolina. The talc has resulted from the hydration of metamorphosed siliceous limestone containing calcium and magnesium silicates. The deposits differ from those at Fort Mountain in being spotty and discontinuous. The mineral here contains less iron, however, and is therefore of a better grade than the talc of the Chatsworth region. It seems possible that more extensive prospecting may reveal deposits in this area which can be profitably mined. The most promising deposits are in Fannin County, 1.5 miles northeast of Mineral Bluff; 3.5 miles northeast of Mineral Bluff; 3.5 miles southwest of Blue Ridge, on the Fannin-Gilmer county line; in Cherokee County, 2.5 miles west of Ball Ground, on Sharp Mountain Creek.

Talc produced in the United States is used in the following trades, listed in the order of amount consumed: paper, paint, prepared roofing, rubber, textiles, toilet powders, and ceramics. In the paper trade talc must be free from grit, oversize particles, alkalies, and carbonates, and must have a pure white color. Talc has been shown to have greater retention on paper than clays, but because high-grade kaolins can be produced cheaply in Georgia, talc is used mainly for special papers. It is the only mineral which helps to produce the appearance of rag paper in silk papers made from wood pulp. Talc also gives a perfect flatness not obtainable by any other mineral. Most of the talc used in the paper trade is obtained from New York, Vermont, and California.

Talc was first used in paint as an adulterant but is now regarded as a beneficial ingredient in some classes of paint. The talc must be ground to pass a 300 or 350 mesh screen and is generally air-floated to insure uniformity of grain-size. Some fire-proof paints are called asbestiform, but talc and not asbestos, is the preferred mineral constituent. Georgia talc, although not satisfactory for the paper trade, should be well adapted for use in paint if a uniformly high-grade product can be obtained. Although pyrite and magnetite are removed in air separation, some chlorite will remain in the refined product, but this should probably not prove to be objectionable. The principle requirement is that the little particles of talc be in scale-like form so as to give the paint body and flatness.

Georgia talc is used in the rubber trade for dusting and as a filler. It can also be used as a packing material for rubber products and as a protective coating for crude

rubber. It is used in roofing-paper manufacture as a filler and for dusting to prevent sticking of rolled paper. Wire-insulating and pipe-covering compounds contain talc. The rope and twine manufacturer, the boot, shoe, and glove manufacturer; the sugar refiner; the manufacturer of cork, soap, filters, lubricants, wall plaster, cleaners, and polishers all have a use for talc. The fact that talc is used by the candy-man to dust chewing gum to prevent sticking and is also used by the veterinary surgeon to dust wounds and sores and for treating skin diseases of cattle is a good illustration of the variety of uses to which this mineral is put. As a dusting agent and as a filler, talc must compete with other finely ground minerals such as sericite, mined in Pickens County, and chlorite, mined in Cherokee County. For some uses finely ground micaceous minerals are preferred because of their flaky form. Talc also competes with whiting, mined in Pickens County, and kaolin, mined in Wilkinson and Twiggs counties.

"Lava" is a trade name for material made from ground talc which is moulded into desired shapes and baked at high temperature. Lava is also made from talc-rock which can be easily tooled before baking. The fired product is a hard white enamel which is strong, has high heat-shock resistance, and high dielectric strength. It is used mainly for gas-burner tips but it is also adapted for use in electrical insulating, spark-plug porcelains, and so on. Many other ceramic uses for talc have recently been developed, although at the present time pyrophyllite, which is extensively mined in North Carolina, is more commonly used. Sagger and whiteware bodies are said to be improved by the addition of talc to the mix. The U. S. Bureau of mines have recently noted that "the properties of ceramic materials containing talc as their principle ingredient are such that they have led to the wide use of these mixtures for low-loss dielectrics, high electric resistance at high temperatures, and high mechanical strength in such articles as line insulators and spark plugs."

Talc-rock or soapstone is used for making crayons and pencils. Most of the talc pencils used in the United States are made in Georgia. Soapstone is used for fire bricks and blocks, and for molds in the manufacture of glass bottles and other glass-ware. Soapstone slabs are used for electric switchboards and base plates, for acid-proof laboratory tables, sinks, hoods, and tanks, and for other purposes where a resistant, insulating sheet is required.

Below is a list of references on talc:

Hopkins, O. B., Asbestos, talc, and soapstone deposits of Georgia: Georgia Geol. Survey Bull. 29, 1914.

Ladoo, R. B., Talc and soapstone: U. S. Bureau of Mines Bull. 213, 1923.

Kiessling, O. E., Minerals yearbook, 1935, U. S. Bureau of Mines, pp. 1069-1081, 1935.

GEORGIA MINERAL SOCIETY HAS ANNUAL MEETING

The annual meeting of the Georgia Mineral Society was held in Atlanta on Monday, October 26. The retiring president, Professor John L. Daniel, of the Georgia School of Technology, made the following remarks which seem to synthesize the broad outlook which the Mineral Society has had since its organization two years ago.

"The purpose of this Society, as set out by our constitution, is primarily the discussion of matters relating to minerals, especially those of Georgia. The meetings are arranged so that members may have a means for exchange of ideas, opinions and experiences. Indirectly the Society sets out to stimulate general interest in minerals. Having now reached our second birthday and perhaps consumed a part of our stored up energies, it is well to pause and evaluate the accomplishments of the Society to date. The programs arranged for our monthly meetings have been interesting and instructive. Although they have dealt with technical and semi-technical subjects, they have been given in language simple enough for all to understand. Speakers have included men from such distant points as New Jersey, Minnesota, and California. The field trips have yielded tangible results in the form of fine specimens, and new minerals for the State, as well as giving many happy and healthful outings at almost no cost. These field trips take the members into mining regions of the State and they thus obtain some knowledge of the State's resources, both material and aesthetic, that might otherwise never be acquired.

"With so many evidences of value of the organization, we look boldly to the future with the determined purpose to see that we continue to grow and become firmly established as one of the important semi-scientific societies of the State. The primary aim of the organization in the immediate future should be to establish its position and to continue the activities already begun. There may be a place in the State for one or two branch groups. If interest is manifested in any section, it should be encouraged. There is a place for a Junior group in almost every school in the State. The effort to organize such groups, as have already been established in two Atlanta schools, should be conservatively pushed. The parent society should encourage its members to speak to school members on minerals and their importance whenever the opportunity arises. The work of preparing a catalog of Georgia Minerals is well started and should be pushed to completion."

Lane Mitchell, Secretary, reported that the Society has grown, since its organization by six or seven enthusiasts, to an active membership of forty-nine.

FORESTRY-GEOLOGICAL REVIEW

DEPARTMENT OF FORESTRY AND
GEOLOGICAL DEVELOPMENT

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No. 12

Man The Greatest Enemy Of The Forest, More Forest Fires Started By Carelessness Than Any Other Way

**Many Started Intentionally—Only A Small Percent Caused By
Lumbering. Greater Care Should Be Taken
Of Our Forests**

The question is constantly being asked: "Why do we have so many forest fires?" According to statistics of the U. S. Forest Service, man is the greatest enemy that the forest has. More than seventy percent of the forest fires occurring in 1934 were "man-caused". It is apparent from the above statement that public willfulness and carelessness cause practically all of the forest fires in the South.

Old time beliefs, now largely disproved, that the woods-burning is desirable to reduce the number of ticks, boll weevils, etc., and to hasten the early grass for grazing, cause the large number of incendiary fires.

The same attitude should be developed toward "FOREST FIRES" as we have when we see a house, or some other structure burning in the city. When we hear the bells clang and sirens shriek, as the fire fighting equipment sweeps through the streets, we know something is burning and want to help extinguish the fire. But, when we are riding through the country and see a forest fire, we make no effort to help extinguish it. This should not be the case. The average city fire is nothing to compare with the roaring sweep of the flames through a forest dried out by a hot sun. In the history of this country more timber has been destroyed by fire than has been put to use.

It must become a habit of all to be sure that the lighted match is out before it is thrown away. The putting out of the camp fire must become a habit.

One great damage that fire does to the

forests is the destroying of young seedlings. Many acres in Georgia would reforest naturally if fires were kept out of the forest.

While riding through the woods in Chatham County, Dr. Chas. H. Herty and Elliott W. Reed discovered that on one side of the road fire had recently burned the woods while on the opposite side of the road fire had not burned. Examining both sides of the road to see the effect of the fire on the young seedlings, they discovered that those on the burned area had been completely killed. On the protected area they

found that young seedlings were coming up and growing excellently. Counting the number on one square foot of ground and figuring the number that would be on one acre, if they were over the entire acre as they were on the place examined, they figured that more than 529,000 seedlings would be on the acre. We are

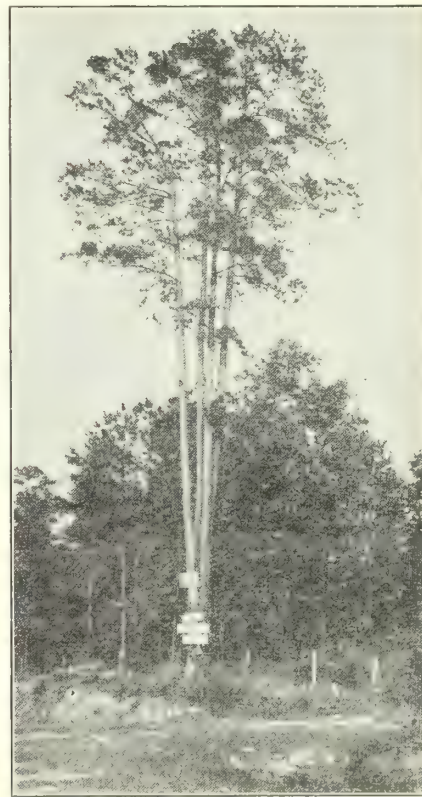
using photographs taken on both sides of the road. In one of the photos young seedlings can be seen. In the other photo it can be seen clearly where fire has burned—no seedlings can be seen in this photo. We are not saying that this large number of seedlings is on every protected acre of forest, but we do say that if fire is kept out of the forests enough seedlings will grow, naturally, to provide trees in a large number. PROTECT THE WOODS FROM FIRE AND GIVE THE YOUNG SEEDLINGS A CHANCE TO LIVE.

(Photos On Page 4)

Many Freaks In Georgia Forests

**Should Not Be Marred
By Signs**

Mr. J. M. Mallory, Industrial Agent of the Central of Georgia Railroad and member of the Commission of Forestry and Geological Development, Savannah, Georgia, recently sent the Editor the photograph below, showing a wonderful freak of nature. The freak is a pine tree. The tree comes



**Photo of freak showing pine tree
coming from the ground as one trunk
and branching into four trunks.**

out of the ground as one trunk. Six or eight feet from the ground the tree branches into four distinct trunks.

Signs have been placed on this tree, which detract from the appearance of it. Our trees and highways should not be marred by such signs. Instead we should plant more trees along our highways and protect them.

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CLAUDE E. BOGGS, EDITOR

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

T. P. O. NEWS

Ellijay

At the Gilmer County Fair, sponsored by the Lions Club, held recently, the Ellijay Timber Protective Organization had one of the most outstanding exhibits.

The exhibit was very instructive and educational in that it demonstrated several phases of improved practices in forest protection and reforestation. A nice exhibit showing the effect of leaf mold was included in the exhibit and was a good demonstration of the extent erosion can be caused by fire burning the woods.

District Forest Ranger, Mr. W. W. Berghoffen, of the U. S. Forest Service, cooperated with the T. P. O. officials in that an excellent display was exhibited of every known species of wood in northeast Georgia, with a series of picture slides showing the actual work done in the forests, also pictures showing a very striking contrast of the woods before and after fires had burned them.

According to an accurate estimate, there were some 8300 people viewed the exhibit during the five days of the Fair. The T. P. O. officials, as well as all members, are hoping that a majority of these people carried home with them the lesson and message which we tried to tell them during the exhibit.

Ogeechee T. P. O.

An inspection trip was made recently of the fire breaks of the Ogeechee T. P. O. on which carpet grass seed was planted during the past spring.

After the announcement was made that C. C. C. labor could be used in planting carpet grass seed on fire breaks, on land under organized protection, the members of the Ogeechee T. P. O. immediately took steps whereby many miles of fire breaks in their organization were planted in carpet grass seed.

During this inspection not only we, but the entire party, which was composed of members of the Ogeechee T. P. O. and other interested parties in Chatham County, were amazed at the rapid growth this carpet grass had made since it was planted.

According to the records of Mr. J. F. Jackson, Agriculture Agent of the Central of Georgia Railroad, under whose direction a large number of these seed were planted, the first planting was made on February 19, 1936. Every person on the inspection trip agreed that the growth made during these nine months was equal to the growth made under other types of planting and conditions of at least two years. The ground was covered solidly with the grass. The cattle in the woods had grazed it continuously making it impossible for a fire to cross the breaks.

T. P. O. members, timber owners as a whole and other interested parties would make no mistake in visiting these fire

breaks and woods in order to see how well adapted the carpet grass is for controlling fire.

We are showing a photograph, which we hope will show the solid mat which this grass has made during the past nine months.

Gaskins T. P. O.

At a meeting of the members of the Gaskins T. P. O. held November 12th the following officers were elected:

Dr. W. W. Turner, Nashville, Ga., President.

Dr. D. L. Branyon, Nashville, Ga., Vice President.

Directors:

Mr. J. H. Henderson, Alpharetta, Ga.

Mr. J. H. Swindle, Ray City, Ga.

Mr. P. L. Howard, Nashville, Ga.

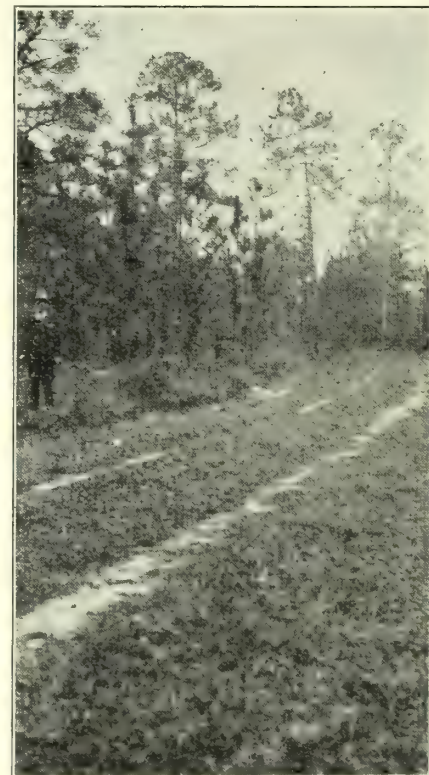
Mr. Jessie McMillan, Lenox, Ga.

Mr. J. H. Gaskins, Nashville, Ga.

Much interest is being manifested by the entire membership of this T. P. O. and plans are already under way whereby we hope to have a larger and more active organization during the coming year than in the past. Organized protection is the only safe way of insuring the woods against the great enemy—FIRE—We are trying to convince the people in this section of the danger fire does to growing timber and we are hoping that through our cooperative efforts the attitude of many, towards the burning of woods, will be changed.



Photo shows excellent stand of carpet grass on fire breaks in Ogeechee T. P. O. Carpet grass seed planted Feb. 19, 1935.



Another view of fire breaks in Ogeechee T. P. O. showing excellent stand of carpet grass. Note that this fire break has been used for transportation.

FIRST DISTRICT

**T P. Hursey, Dist. Forester,
ROME**

Interest in organized forest protection is growing in this district. "The Great Northwestern Timber Protective Organization" has increased its acreage by 120,000 acres this month, making the Polk County unit. This TPO has 310,000 acres signed at the present time.

The Floyd County unit began active patrol work on the first of November. The Polk County unit will begin patrol work on the first of December.

The patrolmen in this district met for a round-table discussion at Camp P-87 on October 30. After discussing various topics of importance in the patrol work, more especially with fire suppression, the members of the group inspected the projects in this section of the State. In the afternoon a meeting was held, at which time, "The Association of Northwest Georgia Forest Patrolmen" was perfected.

The aim of this Association is to ultimately organize the entire district into one TPO. Dr. R. M. Moore, of Canton, Georgia (not a patrolman) was elected president; E. E. Milford, of Jasper, vice-president, and Herman E. Pinson, of Ellijay, secretary. The Association will meet annually.

THIRD DISTRICT

**Stewart L. McCrary, District
Forester, Augusta**

The Gwinn-Nixon State Forest is located in Richmond County, approximately ten miles from Augusta, Georgia. This forest was donated to the State by one of Augusta's most public spirited citizens, Mr. Nixon, in order to demonstrate what could be accomplished in the way of artificial reforestation and fire protection.

A tool house, or cabin, has been built on the area. This building was built of cypress logs, chunked with concrete, with a rock and concrete foundation. The interior finishings are in pine scorched with a blow torch. There are two small rooms for tools and other equipment with a large living room and big open fire-place, which is made of stone. The cabin is located in the southwest corner of the forest and from the front of the cabin the entire forest can be seen.

Plantings of both slash and longleaf pine have been made on the forest. These trees reached a height of six feet and four feet respectively within a period of three years, being planted in 1933. Fairly good success has been had as to the number of trees that have lived, there being only a

small number that have died during this period.

There is also a good example of natural reproduction on this area with seed trees of loblolly pine. These trees have been kept free from fire and are about five years old and approximately six feet in height.

Mr. Nixon planted a number of slash pine near the area in 1931, which have attained a height of approximately twelve feet. Anyone seeing the excellent growth made by the slash pine in this section of the State will change their mind as to the adaptability of the slash pine at this lati-

tude. After seeing how well this species of pine has grown we would not hesitate to recommend it to other timber growers on certain types of soil in this section rather than the loblolly pine or other species.

According to Dr. Herty, the advantage of the slash pine over other species is that it grows faster, will make at least twenty percent more turpentine, makes a cleaner log and a strong, hard wood. Since it does excel the other species of pine on the points mentioned, timber growers should pay more attention to this species and plant a large number of seedlings.



Attractive sign on the Gwinn-Nixon State Forest near Augusta. A number of seedlings can be seen that were planted on this forest a few years ago.

FIFTH DISTRICT

**Herbert C. Carruth, District
Forester, Macon**

Plans are being made for the District Forester to cooperate with the County Agent in Wilkes County to conduct a 5-acre demonstration planting of Black Locust seedlings. These seedlings are being planted in an effort to check soil erosion and will be a good demonstration of the rapid growth Black Locust will make and their suitability for erosion control.

Plans are also being made for the District Forester to visit other County Agents and teachers of Vocational Agriculture within the near future, to help in creating more interest in forestry and doing some practical work with these educational agents.

SOIL EROSION

An amount of soil exceeding the combined extent of Illinois, Connecticut and Massachusetts has been lost through erosion. This is the equivalent of 220,000 farms of 160 acres each.

SIXTH DISTRICT

**W. G. Wallace, Dist. Forester,
Savannah**

**Liberty-Long and Coastal T. P. O.'s Get
New Lookout Towers**

The Coastal T. P. O. with an initial acreage of 55,000 acres now has more than 100,000 acres under protection. A 100-ft. steel tower is being constructed at Eulonia in McIntosh County by Superintendent T. A. Coxon of the Brunswick CCC Camp and will be manned during the fire season now at hand.

A second tower is being erected in Long County east of Ludowici by Superintendent L. I. Martin of the Jesup CCC Camp. This tower will coordinate with the Eulonia and other existing towers to give an ample detection system covering more than 250,000 acres of forest land. It is expected that additional towers will be erected during the next few months to amply cover the additional acreage needing protection.

Chatham County Grand Jury Committee On Forest Conservation

The incoming Grand Jury of Chatham County has a Committee on Timber Conservation consisting of Messrs. T. L. Anderson, Philip Mc G. Shuey and W. B. Blun who, together with Mr. Elliott Reed, President of the Ogeechee T. P. O. and Superintendent Welman McCranie and the district forester made a recent inspection of what is being accomplished in Chatham County in forestry work. Of particular interest were the towers, truck trails and other improvements accomplished by the CCC. A similar Committee of the last Grand Jury gave much attention to the forestry activity in the County and made some very concrete recommendations regarding County cooperation in the matter. As a result the County Police are now co-operating excellently, and some road-side fire hazard reduction is being done by the county. We expect the new Grand Jury to give added impetus to the work already started and sponsored by the Ogeechee T. P. O.

EIGHTH DISTRICT

**H. D. Story, Jr., Dist. Forester
Albany**

The State Nursery located at Albany, Georgia, for the past five years has been unable to supply the demand of landowners throughout the State for planting stock. Each year that the Nursery has been in operation it has been expanded and each year the demand has been greater.

Due to increased interest in reforestation and the great demand for planting stock, the State will expand the Nursery again this year in an effort to meet the demand for 1937-38. There will be better packing facilities, as a larger and more modern packing shed is to be erected. Bid for this shed has already been accepted for the purchase of material and actual construction will begin on Monday, November 23rd. Additional sprinkler lines will be installed and will put under irrigation including the present acreage a total of 8 acres. Approximately 10,000,000 seedlings is expected to be produced for 1937-38 through the proposed expansion.

Applications have been filed for 1937-38 delivery totaling 75,000. The first of these applications came from Mr. E. K. Overstreet of Sylvania, Georgia for 20,000 Slash seedlings.

Seed for the nursery is collected during September and October. The seed is extracted from the burs and put in cold storage until the planting season. Recently the seed has been collected by CCC labor. Formerly it was collected by vocational students and seed collectors.

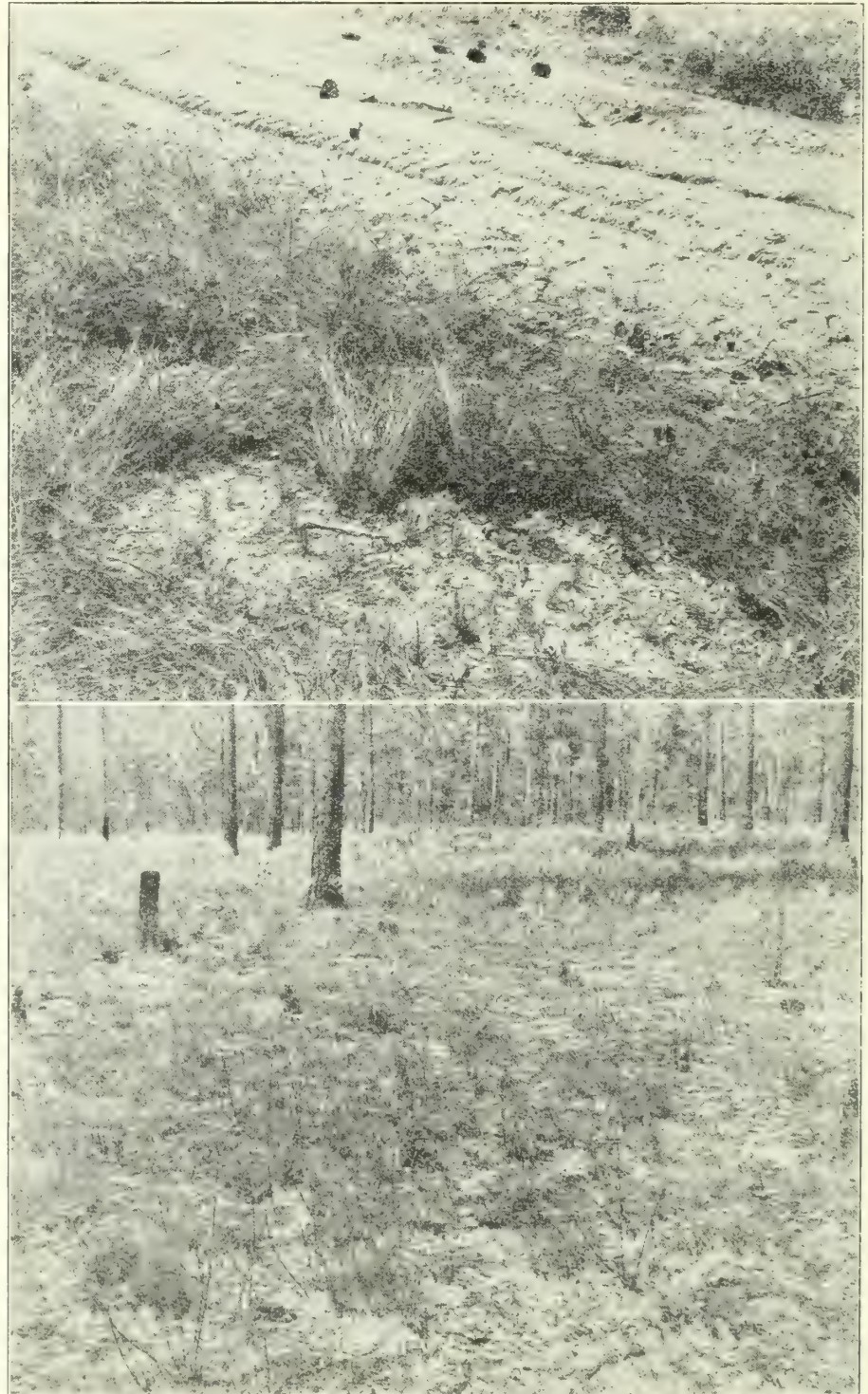
The nursery, which is located on the Newton Road on land arranged for by the Chamber of Commerce, has been visited by hundreds of visitors. Mr. M. E. Murphy is nurseryman and his wife acts as hostess at the nursery. Since 1934 she has kept a visitor's register and approximately 600 visitors have signed it. They have come from Michigan to Florida and from Texas to the Atlantic Coast.

Visitors to the nursery are always welcome.

Largest Forest Acreage

Should Be Protected

Georgia has the largest forest acreage of any State in the Union—Help protect them from fire.



Upper photo shows how seedlings will germinate on protected forest land. A number of seedlings can be seen in the place where the wire grass has been cleared. The lower photo shows area burned by fire. No seedlings can be seen.

STATE PARK NEWS

C. C. C. CAMPS

Editor Expresses Appreciation

Endeavoring to make the REVIEW as interesting and informative as possible, invitations were sent to each of the T. P. O. Secretaries in the State and to the Educational Advisers and Superintendents in each of the CCC Camps. In response to this invitation we have received cooperation from many of the T. P. O.'s and Camps. We would like to express our appreciation for this cooperation.

A number of the CCC Camps publish "camp papers" telling of the various activities of the camps. A number of copies of these papers from different camps have reached our desk and we would like to congratulate the editors of these papers on the splendid papers they are publishing and to express our appreciation for their thoughtfulness in sending us a copy. We would like for each of the camps who publish these "camp papers" to place our name on their mailing list in order that we might receive them regularly.

SP-2

Getting The Best From Definite Training

With the experimental stage past, the Construction Service program has reached a point of definiteness, and organization that enables it to function effectively, and the enrollees are afforded an opportunity for educational development on a wide range.

Working on a program with two points in view, the Using Service and the Army in SP-2 are accomplishing much with their cooperative efforts. The two points stressed are—to get the work done and to train the enrollees for future effectiveness.

Before a job is undertaken the men are given definite instructions in groups, and when they go on the job, each man knows better just what is expected of him. This goes far toward building a harmonious morale, keeps the men happy and enthusiastic and gives them an inspiration to put forth their best efforts.

In this camp the Company has already built a beautiful lake and recreation park, and are now building a lodge, at Neel Gap.

Beautification and landscape work is being done in the lake area, and soon the landscape will be most alluring to all recreationists from all sections.

The aim of the Supervisory Personnel is to so train each man that he will be better able to make a livelihood when he goes back to a civilian occupation.

SP-11

Letter from Project Superintendent to Enrollee Personnel.

My dear Enrollees:—

On October 1st, the Fire Season for this area officially opened, making it imperative that each individual be ever on the alert for signs of fire which at any time, might prove disastrous. Every unguarded fire that you might discover should be reported immediately to the Park Service Foreman in charge or direct to the Superintendent's Office.

From time to time Forest fires, their prevention and suppression will be thoroughly discussed at our regular weekly Safety Meetings. There some idea will be gained as to the enormous destruction of property and life through fire. A very large percentage of the fires which work such havoc among our forests is due to carelessness. Millions of dollars in property losses occur each year, when a little care on the part of some careless individual might have prevented it.

Be careful when you light your cigarette or pipe and see that your match is extinguished. If you have occasion to build a fire, be sure that you have extinguished it completely, leaving no live embers, before you leave. It is much better to be safe than to see the tall timber, which is potential wealth, ruthlessly destroyed by lack of a little care on your part.

In conclusion let me again warn you to be careful with fire in the field. Let's get through the entire season without a conflagration. This will indeed be a splendid record, and one in which all of you will be proud to have participated.

Sincerely yours,

T. C. CALLAWAY,

Project Superintendent.

SP-13

Pine Mountain Forestry Club

Forestry and nature study have been interesting topics of discussion to the members of this company since they started work on the Pine Mountain State Park, something over a year ago. This interest in plant and animal life in the vicinity of the camp and in the park provided the inspiration for the formation of the Pine Mountain Forestry Club, which held its initial meeting on the evening of September 22. The club has a membership composed of 22 members of the company, who, on entering the club, pledge themselves to become a scribe for the PINE MOUNTAIN PROGRESS. Items of interest pertaining to conservation wild life, trees, shrubs and flowers will appear in the column.

Club Objectives

The main objective of the club will be to instill in its members an active interest in the native flora and fauna, and at the same time make the entire camp and company forestry minded and aware of the beauties of nature so abundantly displayed on every side in this vicinity.

The club meets every Tuesday night at

six o'clock for an hour's informal discussion of problems in horticulture, floriculture, entomology, orchards, forest, planting, propagation, budding and grafting, tree surgery, etc.

The club elected Mr. H. E. Smith and Mr. Vincent as advisers. Any other member of the Army staff or the Park Service personnel are welcome at any time to join in the program.

At the last meeting the problem of our national timber resources was discussed, and the methods of the United States Forest Service compared to that of Germany, France and other foreign countries. It is a well known fact that we, as the most powerful and wealthiest nation of modern times, have been dissipating our enormous timber holdings at a rate four times as fast as we are growing it. There is only one end to a policy of this kind—bankruptcy.

Second Growth Pine Gives Good Lumber

Selective Logging And Forest Management Should Be Practiced More

Many lumber companies and other timberland owners in the South have been under the general belief that second-growth timber would yield only low-grade material. Many foresters, too, have looked to the West Coast for the production of choice lumber in the future even though they agreed the South would always produce a large supply of low quality lumber.

Recent selective logging studies by the Southern Forest Experiment Station, New Orleans, show that second-growth shortleaf-loblolly pine does produce high quality lumber. A total of 280 acres of typical second-growth timber, of which approximately one-fourth was old-field type, was logged in such a manner that only 50 percent of the volume of the saw-timber was cut. In this study all trees over 17 inches in diameter, with the exception of a few choice fast growing individuals, were cut. Also, all crooked and defective trees from 13 inches to 17 inches in diameter were removed. Thus the portion of the stand removed contained all the poor trees as well as the slower growing mature timber. In a mill-scale study of the material removed in this cutting B & B lumber amounted to 20 per cent of the total volume and No. 1 amounted to almost 30 per cent.

Reports from companies cutting second-growth timber are to the effect that the production of upper grades is considerably beyond expectations. Thus, the South, at least the shortleaf-loblolly region, is apparently not to become a large producer of low grade lumber but is to continue to produce a large percentage of high grade material. Should selective logging and forest management become widespread this would be a certainty.

FOREST

C. C. C. CAMP NEWS

P-62

Central Repair Shop

The Central Repair Shop, stationed at Baxley, Georgia, under the supervision of Mr. Maurice Finn, Shop Foreman, assisted by Mr. C. H. Keys and Mr. G. E. Bishop supervising mechanics, opened and began operating in July, 1935.

Previous to this time all Georgia Forest Service trucks were repaired at the camps in which they were stationed by one of the above named mechanics, assisted by the camp mechanic. This, of course, caused a great loss of time, since it takes two men a long while to overhaul a truck, especially with the type of equipment that the camps afforded or that the supervising mechanic could carry with him from one camp to another.

Therefore, it was decided that a central shop be put up and bring the three mechanics mentioned above together with sufficient equipment and tools to give trucks complete overhaul jobs. Now all Georgia Forest Service Trucks, also tractors, rotary scrapes and other pieces of heavy equipment are brought into the Central Repair Shop for repairs.

We have found that we can do this work at about 27% of the amount that it would cost to have this work done outside of the shop.

We have, also, constructed nine heavy trailers to be used for transferring heavy equipment. One of these trailers is being used by Georgia Forest Service for transferring heavy equipment throughout the state of Georgia, which saves the government approximately 80% of the amount that it would cost to ship this heavy equipment by rail. The other eight trailers are being transferred to other states to be used for the same purpose that ours is being used.

We carry a stock of approximately \$3,000.00 worth of parts in our stock room. Using the "value inventory system" we are able to keep our stock up to the amount desired.

We are glad to report that our shop is first on the list of Relative Efficiency Rating in region eight.—By Foster Lewis.

P-68

P-68 has one of the best Glee Clubs of any camp within the State.

During the Slash Pine Festival held in Waycross the Glee Club furnished the music and entertainment on the night, Friday, November 13th.

The Club is composed of twenty-four members and is under the direction of Mr. Henry W. Derden, Educational Adviser for the Camp.

P-81

In celebration of the Third Anniversary of Camp Ga. P-81 at Bloomingdale, the officers, foremen and men, joined in an autumn dance in the camp Recreation Hall, Friday, November 13th. The evening's program consisted of an hour floor show, a menu of delicious refreshments, and dancing. An orchestra was engaged in Savannah and the men and their families were the guests of the camp.

Camp Ga. P-81 was established at Bloomingdale November 10th, 1933 and during the past three years has accomplished worlds of work in the Ogeechee Timber Protective Organization territory.

Since the establishment of the camp the men have constructed sixty-five miles of telephone lines, fifty-five miles of truck trails, more than a hundred culverts, twenty-four bridges, three 100-foot towers and a number of other smaller projects. One hundred and forty-five miles of firebreaks have been completed to date and according to the fire records these fire lanes have been a lifesaver to TPO members. Since the establishment of this camp fires have been reduced seventy-five percent.

Two hundred and sixty-six thousand acres of surrounding lands have been type mapped by the men of Camp P-81 since the beginning of the camp. The crews now type mapping are averaging approximately thirty thousand acres per month.

The TPO area worked by this camp is located in three counties with approximately an acreage of 150,000 acres.

During the past month two grand jury committees from Chatham county have inspected the entire projects along with Forestry and TPO officials.

P-90

October 1st began the eighth six-months Emergency Conservation Work Period. During this six months Camps will build miles of truck trails, firebreaks and telephone lines. New lookout towers will be erected, thousands of acres of land type mapped, forest stands will be improved and seedlings will be planted.

A gratifying feature of the eighth work period is the fact that quality work is being stressed, instead of quantity as was true at the beginning of this organization when no one knew just how long it would continue. The work is now being designed with a view to the future as well as to the present.

This work period at P-90 will see the completion of a Timber Protective Organization building which will contain an office for the secretary, a supply room, and a room designed for a short wave receiving set. As the towers in this area are tied up by telephone to the adjacent area which owns and operates a short wave broadcasting station, arrangements can be made for broadcasting the location of a fire in both areas.

At P-90 we have an interesting and unique freak of nature. Truck trail 7C7 has been constructed below a 12,000 acre artificial lake which strangely enough is situated on top of a hill, if the slight rises in elevation can be defined as hills. The lake was formed by damming the outlet of a huge cup shaped depression. When the water is raised to the level of the dam, it flows out the opposite end of the cup, there being no spill way at the dam.

J. M. LAWTON.

P-92

Work projects have been approved for the members of Camp P-92 to do until January 1, 1938. Part of this work will consist of completion of truck trails in Brantley County, begun by Georgia P-70. Projects have also been approved for strip mapping, two and one-half miles of fill work on trail in the King Bay section.

The Jackson trail, one of the oldest roads in Georgia, is to be converted into a truck trail. Several projects will be built on this trail. Plans are under construction to extend the Zuta Tower, located at Zuta, Georgia, 20 feet higher, making it 100 feet high, with a full seeing range into the surrounding territory.

The construction of a 100-ft. tower in McIntosh County will begin in a few days. One hundred man working days will be spent by enrollees of this camp in restoring foot-trails, roads, fences, and in general cleaning up of the undergrowth in Santo Domingo State Park.

The camp "rolling stock" has been increased recently by two trucks.

With the coming of Mr. Ed B. Martin as educational adviser, our educational department has taken on new life. New classes in the following subjects have been organized and added to those already being taught: Elementary work for removal of illiteracy, Arithmetic, Spelling, Georgia History, Bookkeeping, Mechanical Drawing, Landscaping, Leather Craft, Dramatics, Sign Painting. Three new pieces of wood-working machinery have been added to the shop equipment. This equipment is being installed in a suitable building which is being built for the Forest Service of this camp.

INTERESTING FOREST FACTS

Did you know that?

Untreated heartwood of either catalpa or red mulberry is more durable than untreated white oak.

At various times more than 60 different species of timber have been sold under the name of mahogany.

All Lombardy poplars are males. They have descended by vegetative propagation from a specimen that originated on the banks of the River Po in northern Italy.

GROUND WATER IN THE CRYSTALLINE ROCKS OF GEORGIA

Reported by THE DIVISION OF GEOLOGY

GEOFFREY W. CRICKMAY

Water has been called Georgia's unknown natural resource, for we have generally taken water supply more or less for granted without obtaining any definite record of available water supply from surface streams or from underground sources. Water is a vital necessity for industrial and municipal development, and consequently the factual data relating to this natural resource are of utmost importance to the future growth of the State. A previous article in these pages, reprinted as Information Circular 8, describes methods used in gaging the surface streams of Georgia. The present article is concerned with sub-surface or ground water, the water that lies hidden below the ground level but which is nevertheless the most important source of water for domestic use in rural and suburban areas.

Two types of ground-water occurrence are recognized: the artesian and non-artesian types, respectively characteristic of the Coastal Plain region and the area of crystalline rocks.

The Coastal Plain region of the State consists of gently inclined beds of sand, limestone, and clays. Rainwater from the surface finds access into the series where pervious and porous beds crop out at the surface. Such water-bearing beds which are capped by impervious layers act as ducts to carry water down the dip to considerable depth. Thus the deep wells at Savannah obtain several million gallons a day at less than 600 feet from water-bearing beds which are exposed at the surface more than fifty miles to the north. Free-flowing wells are possible where the intake area is somewhat higher than the well, or in other words where the water is under sufficient hydrostatic head to be forced to the surface. This is the familiar principle of artesian water supply, and its application to the Coastal Plain region of Georgia is fully discussed in our Bulletin 15, "Underground Waters of Georgia" by S. W. McCallie.

The area of crystalline rocks north of the Coastal Plain is one of complex structure. No definite water-bearing beds occur, and therefore artesian flow of water is nowhere found. Whereas the geologist can tell from surface examination the approximate depth to water at any point in the Coastal Plain region, such predictions are impossible in the area of crystalline rocks. The principles controlling ground-water occurrence in these rocks is here briefly reviewed.

Figure 1 is a cross-section of a typical

valley in the Piedmont Upland. Here is shown the relation of topography to water table, the level below which all rocks are saturated with water. The water table fluctuates through the year, rising at times of greatest rainfall and dropping at times of least, but always lagging somewhat behind precipitation. Rather meager information indicates the lowest level to come in the fall of the year, October or November. The water table is marked by the level at which water stands in a well. It should be remembered, however, that the surface does not mark the level of an underground lake but rather a very irregular plane between saturated and unsaturated rock. There is a constant but slow movement of ground-water towards low points in the water table, and a part of this sub-surface water will finally emerge as seeps and springs to enter surface drainage channels. Movement of ground-water takes place along innumerable cracks and crevices in the rocks and not along well-defined channel ways; except in limestone regions there is no such thing as "under-ground streams."

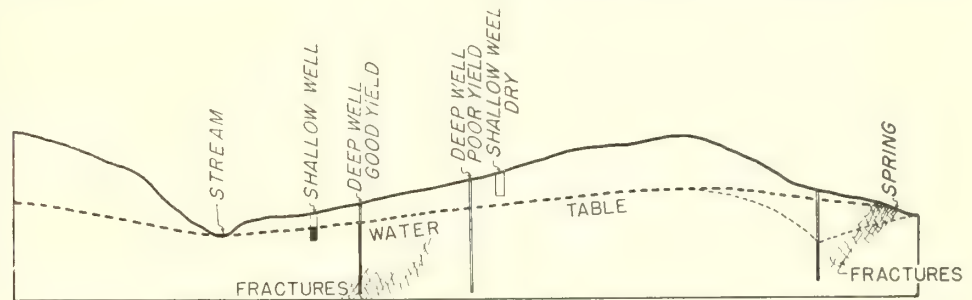


Fig. 1. Cross-section of a typical north Georgia stream valley showing relation of water-table to topography. Heavy pumping from a deep well, as that at the right hand side of diagram, may depress water-table and thus dry up nearby springs.

When a shallow well "goes dry", the ground-water level has merely dropped below the base of the well. In many farming areas the clean cultivation of crops allows excessive run-off, and consequently very little water seeps into the ground to be added to the under-ground reservoir. It is for this reason that many wells go dry after supplying plenty of water for many years. Recent experiments by the Soil Conservation Service indicate that a very close relation exists between soil erosion and the water table; conservation of soils also means conservation of ground water.

The crystalline rocks have a very low porosity compared to the sands of the

Coastal Plain, averaging less than 1 per cent porosity compared to 15 per cent for sands. Furthermore, their impervious character does not permit this small amount of water to enter wells unless the rocks are fractured. Most of the water in crystalline rocks is contained in cracks and crevices, and the yield of any deep well is largely dependent on the extent of fracturing. Weathering serves to open up incipient cracks near the ground which thus allows freer flow of water than at depth where the fractures are tight.

Wells are of two types, shallow and deep. No sharp line divides these two types except that shallow wells are generally dug wells of large diameter averaging less than 40 feet in depth, and deep wells are drilled wells of small diameter averaging more than 75 feet in depth.

The location of shallow wells is usually determined by convenience. The well is frequently placed within a few yards of the house. Adequate provision should be made against contamination, although this is rarely done. If a shallow well becomes muddy after heavy rain, surface water is seeping directly into the well with no chance for filtration. Shallow wells are undesirable in towns and suburban areas, because even though surface water is excluded from the well by casing, there is always the opportunity for contamination by seepage through open fractures.

Deep wells are usually cased below the zone of weathered rock so as to prevent any contamination, but by descending to a

zone where fractures are tight the deep well has less chance of obtaining an adequate water supply. Attempts at "shooting" a well, blasting at the bottom with some explosive, has rarely been attempted, and it is uncertain whether such shooting will serve to open fractures sufficiently to materially increase the yield. This Division is continually asked for aid in locating advantageous sites for deep wells in crystalline rocks, but the nature of these rocks generally prevents any satisfactory predictions. In so far as water occurs mainly in fractures which cannot be seen on the surface, no one can state with any degree of assurance that this is a good location and that an inferior one. Drillers wisely refuse

to make contracts guaranteeing water in the crystalline rocks. The common belief that the crest of a hill is a desirable location has no apparent basis. Such locations mean greater depth to the water table than on hill sides, and generally they mean greater distance to case the well.

Those who contemplate drilling a deep well in crystalline rocks must be prepared to take a certain gamble. The geologist can frequently tell him whether the gamble is a good or poor one, but beyond that definite assurances can only rarely be made. Some indication of what to expect can be obtained from the record of adjoining wells, and in this connection it is important to have a complete record of all drilled wells and their performance. This Division has now compiled an index of all wells of which a record has been made. Drillers can cooperate in this work by supplying the Division with well cuttings and information on depth and yield.

The depth of deep wells in the crystalline rocks ranges from 80 to 2,175 feet, and the diameter from 2 to 14 inches. The property owner should at the start set some limit for the depth of his well, otherwise the temptation is to continue drilling "just a little further" in the hope of salvaging an otherwise dry hole. As previously noted, fractures in which water occurs become tighter with depth, and therefore the chances of obtaining water becomes increasingly slight as the hole descends. Many of the deep wells in Fulton and DeKalb counties obtain 90 per cent of their yield from the top 300 feet. Experience indicates that 250 to 300 feet is a limit beyond which further drilling is futile unless recommended by special local conditions.

The diameter of a well is determined by the amount of water required. Six inches is a common size for domestic use, but many 2 and 4-inch wells have yielded as much as 4 gallons a minute. Wells for industrial use range from 8 to 14 inches, and yields range from 5 to 225 gallons a minute. Casing depth is determined by local conditions; the average for all wells drilled in the crystalline rocks being about 45 feet.

The cost of well drilling varies with diameter of the hole, depth to be drilled, and the nature of the rocks. Six-inch wells average \$2.00 to \$3.50 a foot for the first hundred feet, and \$2.50 to \$5.00 a foot beyond a hundred feet. Drilling beyond a depth of 300 feet is generally more expensive.

A thorough study of ground-water in the crystalline rocks, particularly of some special area such as Fulton and DeKalb counties, should be made in the not too distant future. Such a study would produce more definite information on the occurrence of ground-water in these areas than can now be presented. In so far as there are somewhat more than two and a half million people in Georgia directly dependent on ground-water for domestic

water supply, this natural resource justifies very serious consideration.

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 Smith R. W., Water, Georgia's Unknown natural resource: Georgia Geol. Survey, Inf. Circular 8, 1936.

Geological Survey To Be Made Of Cartersville Area

Bartow County, Georgia, has produced valuable minerals ever since the first discovery of manganese in the United States near Cartersville in 1866. The county is now famous for the variety of minerals found within its borders. Here are mined manganese, barite, other, and limestone, and here also occur deposits of graphite, gold, bauxite, and potash slates. The State Division of Geology made a complete survey of this district in 1918 because of the necessity at that time of a domestic source of manganese, an essential war metal. New developments and more extensive mining in recent years have made a thorough resurvey increasingly necessary.

Such a survey is now assured according to advice received by the State Division of Geology from the United States Geological Survey. Mr. T. L. Kesler has been assigned to the project and started actual field work in the area on November 9th. Mr. Kesler has previously carried on geological investigations in the South, and he is thus well equipped to make the new survey of the Cartersville district which will necessitate several months field work. It is understood that a new geologic map will be prepared and that all mines and prospects in the area will be examined.

Georgia Mineral Society

The annual meeting of the Georgia Mineral Society was held in Atlanta, on Monday, October 26. Thirty-seven members and friends attended the banquet-meeting at which annual reports of officers were presented. Mr. William B. Pitts, donor of the spectacular collection of polished stones on display at the State Capitol, made a surprise appearance. Mr. Pitts had arrived the previous day from California, his home, and is to remain in Atlanta for several months. Prof. John L. Daniel, Georgia School of Technology, gave an address as retiring president in which he reviewed the accomplishments of the Society and made pertinent suggestions for its future growth. Professor Daniel singled out for special commendation the work of the committee on organization of junior societies in the schools and the work of the

committee on preparing a catalogue of all Georgia minerals. Newly elected officers are: President, G. W. Crickmay; Vice-president, J. Lester; Secretary, Mrs. Mattie Sue Walker; Treasurer, Lane Mitchell. Dr. Frank Daniel has been appointed Historian for the Society. All correspondence relating to the Society should be addressed to the Secretary at the office of the State Geologist, 425 State Capitol, Atlanta.

The Society for Georgia Archaeology Holds Meeting at Sea Island To Study Findings In Georgia

The Society for Georgia Archaeology held its fall meeting at Sea Island Beach, Saturday, November 7. Among those present were Robert Fechner, Director of the Civilian Conservation Camps, Washington, D. C.; Herbert E. Kahler, of the National Park Service, St. Augustine; Dr. A. R. Kelly, in charge of the Indian Mounds at Macon; and Dr. Preston Holder, of the Smithsonian Institute, directing excavations at the mounds on St. Simons Island, and many other interested visitors.

The morning session was devoted to a discussion of archaeology. Dr. C. C. Harrold, President of the Society, told of the general progress of the work in Georgia. Reports on progress of excavations were made by Dr. Preston Holder of Sea Island, Dr. A. R. Kelly of Macon, Mr. G. A. Turner of Eatonton, and Mrs. Wayne Patterson of Columbus.

After a luncheon at the Cloister, Dr. Holder led a field trip to St. Simons Island to inspect the excavations that are being made under the sponsorship of the Society, the Sea Island Company and the Glynn County Works Progress Administration.

Officers of the Society include: Dr. C. C. Harrold, Macon, President; J. M. Mallory, Savannah, First Vice-President; Mrs. M. E. Judd, Dalton, Second Vice-President; R. W. Smith, Atlanta, Secretary-Treasurer. Members of the Executive Committee are: R. R. Otis, Atlanta, Chairman; W. A. Harris, Macon; Dr. A. V. Henry, Atlanta; Judge Ogden Persons, Forsyth; Linton M. Solomon, Macon; and Alfred W. Jones, Sea Island.

Lumber Buyers Guide

A newly revised edition of the "Buyers Guide", the official directory of subscribers to the Southern Pine Association, now is ready for free distribution by the Association. This booklet is of value to retail lumber dealers, other distributors and industrial users of lumber since it gives data concerning the various member companies and individual manufacturers, location of their plants, capacity, equipment, railroads serving them, species of output, items manufactured and specialties of the mills. Southern pine manufacturers are listed alphabetically and by states.

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DEPARTMENT OF FORESTRY AND
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No. 1

SMALL TREES SHOULD NOT BE CUT—MORE PROFIT REALIZED IF SELECTIVE CUTTING IS PRACTICED

**TREES OF SMALL DIAMETER SHOULD BE ALLOWED TO GROW
LARGER—ONLY SMALL TREES THAT ARE DEFORMED
OR DISEASED SHOULD BE REMOVED**

Why cut small trees? The answer to this question is, in most instances, is that premature cutting of the smaller trees has been due to the need for an immediate income from second-growth stands, which has forced the owners to utilize small trees, even though it was realized that this was wasteful in reducing future income. In most instances, however, the principal reason for the short sighted cutting of small trees has been ignorance on the part of the landowner of the possibilities of future growth and of the present and future profits that were being sacrificed by this wasteful cutting.

Necessary as it may seem to cut small trees, many manufacturers have found, that by giving this problem careful study, the practice can be avoided to advantage. It has been clearly shown by numerous studies that small trees are expensive to log, cost much more to manufacture into lumber, and produce lower grades of comparatively low value.

According to the Southern Pine Association, trees smaller than 12 inches in diameter at the stump should be considered under-sized saw logs. Many successful log operators do not cut trees smaller than 14

tion more profitable.

Trees as small as 7 inches d.b.h. will produce lumber, however, and it has been a common custom of both large as well as small mills to cut part or all of these sub-marginal trees from 7 to 16 inches d.b.h., without realizing that such trees were being taken at a loss. Oftentimes the leaving of these unprofitable trees would have provided a sufficient growing stock to have made possible a second cutting in from 10 to 20 years. In nearly all cases the leaving of these trees would have furnished sufficient seed trees to have assured the restocking of the area with seedlings. Cutting such small unprofitable trees has not only cost the operator money but has seriously reduced future production and has postponed for many years the possibility of making another cutting.

The fact that small trees can be manufactured into lumber only at the expense of the larger ones is strikingly shown by the results of studies made by the Forest Products Laboratory of the U. S. Forest Service. The following figures show the net stumpage realization values from different size trees;

Although the two studies reported upon

NET STUMPAGE REALIZATION VALUES

Tree Diameter at Breast Height	Shortleaf Pine (Ark. 1928)		Loblolly Pine (Va. 1931)	
	Per M. Bd. Ft.	Per Tree	Per M. Bd. Ft.	Per Tree
8	Minus— \$ 4.67	Minus—\$0.21	Minus—\$12.35	Minus—\$0.41
10	Minus— .05	Minus— .01	Minus— 5.60	Minus— .33
12	3.08	.35	.49	.05
14	5.59	1.06	5.23	.85
16	7.59	2.08	8.31	1.99
18	9.36	3.64	10.80	3.42
20	10.92	5.07	13.07	5.29

inches in diameter, and some find it advantageous to leave standing all sound and healthy trees smaller than 17 or 18 inches in diameter. When only "ripe" trees are cut, the larger log reduces both logging and milling costs and yields better grades of lumber, thus making the entire opera-

in the above table were made in areas far apart as Arkansas and Virginia, and under dissimilar conditions, it is notable that in both instances trees of smaller than 12 inches in diameter at breast height cost more to manufacture into lumber than the lumber they produce could be sold for.

Vocational Teachers And Students To Receive Herty Prizes In 1937

**Awarded For Doing Outstanding
Work In Forestry**

The Georgia Forestry Association will offer prizes to the two teachers of vocational agriculture doing the most outstanding work in forestry during the 1936-37 school year. These prizes are known as "The Herty Prizes", in honor of Dr. Chas. H. Herty.

The first prize, in the amount of Fifty Dollars, will be awarded to the teacher of vocational agriculture doing the most outstanding work in Forestry. The second prize, in the amount of Twenty Five Dollars, will be awarded to the teacher of vocational agriculture doing the second best work in forestry.

A cash prize of five dollars will be awarded for five consecutive months, beginning with February, to the student of vocational agriculture submitting the best article, for publishing in the REVIEW, pertaining to his home, or school, forestry project.

A cash prize of Fifteen Dollars will be awarded to the negro teacher of vocational agriculture doing the most outstanding work in forestry, and a cash prize of Ten Dollars will be awarded to the negro teacher of vocational agriculture doing the second best work in forestry during the 1936-37 school year.

The teachers of vocational agriculture in both white and negro schools include forestry in their course of study. The Division of Forestry or the Department of Forestry and Geological Development cooperates with these teachers to the extent of furnishing all available material and supervision by the District Foresters of the school forestry projects.

In appreciation of the splendid work that is being done in these vocational schools the Georgia Forestry Association has offered, for a number of years, cash prizes to the teachers doing the most outstanding work in their school forest program. The Association is only too glad to offer these awards again for the coming season.

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CLAUDE E. BOGGS, EDITOR

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Elmer E. Dyal, State Forester.....	Atlanta
Jack Thurmond, Asst. State Forester.....	Atlanta
Claude E. Boggs, Educational Mgr.....	Atlanta
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W. G. Wallace, Dist. Forester.....	Savannah
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Geological Division

Richard W. Smith, State Geologist, and Secretary to Commission.....	Atlanta
G. W. Crickmay, Asst. State Geologist.....	Atlanta
Lane Mitchell, Asst. State Geologist, on leave.....	Atlanta
Miss Margaret Gann, Clerk.....	Atlanta

Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.



SP-9

With the experimental stage past and a certain amount of skill and training obtained during this stage, the enrollees at Chehaw Park have been, and still are, moving large line trees with great success.

To date, the enrollees under proper supervision have moved approximately 75 pines, ranging from 6 to 30 feet in height. Such species as longleaf, loblolly, shortleaf and slash pine have been moved, and it has been found that one species can be moved just as satisfactorily as another, if proper care is taken.

At a meeting of the leaders and assistant leaders of SP-9 held recently, public speaking and debating were discussed. The program was organized whereby two members from each barrack would be chosen to represent each section in a debate.

These debates will be held as often as is possible. Subjects will be discussed that will be of interest to the camp personnel.

A class was held recently dealing with public speaking for those who are interested in this subject.

Executive Committee Of The Georgia Forestry Association Holds Important Meeting In Atlanta November 13

Many Topics Relative To Legislation To Be Sponsored During Coming Session Of Legislature Discussed And Resolutions Adopted Regarding Other Phases Of Important Developments

The Executive Committee of the Georgia Forestry Association held an important meeting in Atlanta on Friday, November 13.

Important discussions regarding legislation for the benefit of forestry to be sponsored by the Association during the coming session of the Legislature were held. Resolutions were passed commending the officials of the Union Bag and Paper Company for their policies designed to promote better management of the private forest land tributary to the company's pulp mill at Savannah.

Resolutions were also adopted regarding the splendid work being done by the Georgia-Carolina Live Stock Association for the promotion of growing and reforesting the timberland through the prevention of forest fires; the raising, feeding and growing of pure-bred and improved breeds of live stock in Georgia and South Carolina, in connection with the reforestation program.

At a recent meeting of the Georgia-Carolina Live Stock Association, resolutions were adopted in which they have asked the members of the C. C. C. Camps and the Georgia Forest Service to extend the services which they are now rendering in the growing and reforestation of timber and the production of pastures for live stock.

We are giving these resolutions as adopted by the Georgia Forestry Association and the Georgia-Carolina Live Stock Association, in order that the readers of the Review may know of the close cooperation between these two agencies in the promotion of better forestry practices, not only in Georgia but in our neighboring State of South Carolina.

"Resolution"

"We, the members of the Georgia Forestry Association, extend to the officials of the Union Bag and Paper Company this expression of our appreciation of the progressive and forward looking policies adopted by that company designed to promote better management of the private forestry land tributary to the company's pulp mill at Savannah. We believe this will be a valuable precedent to other mills to be established in the future and will do much to promote better forest fire protection and to insure the permanence of the forest resources in the territory adjacent to such mills."

"Resolution"

"WHEREAS, The Georgia-Carolina Live Stock Association is a chartered Corporation with Directors and Membership, resident in counties in Georgia and South Carolina comprising the territory familiarly and properly known as the Coastal Empire; and

"WHEREAS, it is the object of this Association to further the growing and the reforestation of timber through the prevention of forest fires, and the raising, feeding and growing of pure bred and improved breeds of live stock, in Georgia and South Carolina, by the destruction of the grasses which now feed forest fires and are of little or no benefit as grazing, and to sow in the place of these grasses, carpet grass, dallas grass, lespedeza and other grasses which will replace the present wild grasses and make forest fires impossible, thus affording complete protection to timber, and carry the cattle eight or nine months in the year instead of three or four months, as under present grazing conditions; and

"WHEREAS, these objects and purposes are in line with those of the Civilian Conservation Corps and the Georgia Forest Service and the means adopted by the Civilian Conservation Corps and the Georgia Forest Service will further the objects and purposes of the Georgia-Carolina Live Stock Association, and vice versa, so that if cooperation between these three organizations can be secured, a larger number of citizens will be reached and will receive benefit than is the case at the present time.

"THEREFORE, be it resolved, that the Georgia-Carolina Live Stock Association, through its Board of Directors, in meeting duly assembled, hereby petitions the Civilian Conservation Corps and the Georgia Forest Service to extend the service which they are now rendering in the growing and the reforestation of timber and the production of pastures for raising, feeding and growing of pure bred and improved breeds of live stock of all kinds, to land owners who reside in the Coastal Empire Sections of Georgia and South Carolina, and who are not eligible, at the present time, for membership in the Georgia Forest Service.

"Resolution"

"WHEREAS, the livestock industry and

(Continued on Page Three)

Second Annual Slash Pine Forest Festival A Great Success

**Held In Waycross November 10-14—To Be Annual
Affair—Many Interesting And Educational Ex-
hibits Shown—Entertainment Features
Attract Throng.**

The second annual Slash Pine Forest Festival was held in Waycross, Georgia, November 10-14. Emphasis was placed on the possibilities of the pine forests and the allied resources of the slash pine belt, which has its center in the southeastern section of the United States. The Festival was formally dedicated to Dr. Chas. H. Herty, eminent Georgia Chemist, who has contributed much to the development of the paper industry in the southeast. His experiments, in Savannah, have proved conclusively the practicability of using the southern pine pulp in the manufacturing of newsprint and other high grade paper.

According to an announcement made by J. S. Elkins, Secretary of the Slash Pine Forestry Association, plans are already being made to hold the festival again next year.

The Directors of the Association expressed their appreciation for the splendid co-operation given forestry workers, and others, who assisted in making the 1936 festival such a tremendous success.

Interlude of the Slash Pine

One of the most colorful and significant features of the Festival, was a two day presentation of the drama "Interlude of the Slash Pine". This drama was a series of eight cycles which pictured the development and destruction and the re-development of the Slash Pine of the southeast.

The presentation was not a pageant, but rather a series of picturesque interludes presented after the fashion of the "March of Time". It was written and directed by Gene Bergmann, of the Federal Theatre, assigned to servicing recreational projects in Georgia.

Society of American Foresters Hold Call Meeting

The Southeastern Section of the Society of American Foresters, whose membership embraces the states of Georgia, Florida, Alabama, North Carolina, and South Carolina, met in special session during the festival. Topics pertaining to the society were discussed.

4-H Clubs Have Special Day

Thursday, November 12, was officially designated as 4-H Club Day. On this day more than 700 4-H Club members from the counties in the southeast visited the festival. A colorful parade was held before the club members visited the exhibits. This parade marched through the streets of Waycross, attracting the attention of the citizens of the town and the visitors.

An attractive exhibit was prepared by the County Agents and 4-H Club members. The exhibit was designed especially to

show the value of proper forest management.

T. P. O. Day

Friday, November 13, was officially designated as T. P. O. Day. A large number of T. P. O. members throughout the state attended the festival on this date. The morning was spent in viewing the educational exhibits. The afternoon was spent by the members attending actual field demonstrations, showing the different types of plows and other equipment used in making fire breaks, and other type of forestry work.

The festival was officially dedicated to Dr. Chas. H. Herty, Friday evening. In talking to those attending the exercises Dr. Herty stressed the importance of proper protection of the forest from fire and urged the people living in the Slash Pine region to cooperate in an advertising campaign in order to let other people know of the great possibilities of the southeastern section as a source of wood suitable for making newsprint paper.

DR. H. N. WHEELER, CHIEF LECTURER U. S. FOREST SERVICE ATTENDS FESTIVAL

Gives Four Interesting Lectures

Speaking to a large and enthusiastic audience each evening of the festival, Dr. H. N. Wheeler described forestry as the proper use of lands, and it concerns every citizen of the United States, regardless of his business.

Doctor Wheeler has been connected with the Forest Service for more than 31 years, and has lectured in every state in the Union, in most of them many times.

Speaking to a large audience at the exposition building each night, with the aid of a silver screen on which was shown forest scenes from every section of the United States, he paid tribute to the improvement of forestry methods in Georgia, particularly to the training of young foresters.

Four Phases

He stressed the value of the forests from four angles, first, because of their economic importance in furnishing lumber and cross ties and turpentine and other products needed in the commercial world; second, for their watershed values, the trees of the nation being described as the factor which prevents the wasting of land into the basins and lakes and the sea; third, for their protection to wild life, including large and small game, fish, birds and flora; fourth, for human uses, providing recreation centers where people of the United States may relax and enjoy the great outdoors, with all

the advantages of pure air and wholesome surroundings.

Fire Disastrous

He laid a great deal of stress on the fire menace, asserting that the burning of forest areas reduces the production of gum by one-fourth.

"You can't afford to pay taxes on land that won't produce anything, and you have 23,000,000 acres in Georgia that is suited only for the growing of trees," he said, urging the conservation of forests.

There are 3,708,000 acres of land burned each year in Georgia, despite the movement for organized protection, the speaker said, expressing the belief that a large percentage of the woods fires, are set intentionally by landowners.

No Political Matter

Discussing the various phases of forestry, Doctor Wheeler insisted that "forestry is not a political matter." He drew applause from the audience when he digressed to comment that "trees will grow just as well for a Republican as a Democrat, even this year".

He paid tribute to the economic and educational value of the Civilian Conservation Corps, and outlined activities of the CCC throughout the United States.

References to "beauty spots" of the United States included comment on Georgia's famous Okefenokee Swamp.

The Division of Forestry cooperated with the officials of the Festival, in making it the best Forestry Festival ever held.

Executive Committee Holds Meeting

(Continued from Page Two)

forestry have many inter-locking and mutual interests and problems, and,

"WHEREAS, the Georgia-Carolina Livestock Association has achieved much progress in promoting the industry and arousing appreciation of better grades of livestock, and,

"WHEREAS, one essential to the success of the undertaking is improved pastures and ranges, which is being sought through the substitution of carpet and other more nutrient grasses for native wire grass, and,

"WHEREAS, the Federal Forest Service and the Civilian Conservation Corps, at the solicitation of the Georgia Forestry Association, planted last season fire breaks, roads and trails with carpet and other grasses on the lands of members of the Timber Protective Organizations, therefore be it:

"RESOLVED, the Georgia Forestry Association extends congratulations to the Georgia-Carolina Livestock Association on the success already attained and assures it of our continued interest and cooperation. Be it further,

"RESOLVED, we recommend to the Federal Forest Service and the Civilian Conservation Corps such assistance as they may consistently and legally extend."

FIRST DISTRICT

**T P. Hursey, Dist. Forester,
ROME**

Much time, during the past month, has been devoted to visiting the vocational schools in District One.

Several vocational schools have been visited during the past month and assistance given the teachers in selecting and surveying school forest projects.

Plans are being made now to put on a district wide educational program during the month of January, showing pictures in vocational, and other schools, five nights a week. In this way we hope to contact several thousand people.

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

Digging and shipment of nursery stock is completed at the North Georgia Nursery where 125,000 Loblolly Pine and 46,300 Black Locust seedlings were produced this year. Due to lack of space and the demand for Black Locust, no Black Walnut seedlings were grown this season. Considering amount of seed planted and small space devoted to pine, production of Loblolly seedlings was very successful. Production of Black Locust was not as successful, due mainly to the dry weather during germination of seed and immediately thereafter. The nursery is not equipped for watering Black Locust plantings. Plans are in effect to increase the available number of Loblolly seedlings next season and also Black Locust.

THIRD DISTRICT

**Stewart L. McCrary, District
Forester, Augusta**

Increased interest in reforestation has been manifested in District Three recently to the extent that more than 114,000 pine seedlings have already been planted this season. Before the planting season is over more than 35,000 more seedlings will be planted. This is quite an increase over the number of seedlings planted in this district during the past season and it is very encouraging to note the increased interest being manifested by the timber owners in reforesting idle acres of land.

The vocational schools in this district are also manifesting much interest in the forestry program. The plans of the District Forester are to visit as many of schools as is possible after the holidays and assist them in any manner that they may wish.

Sap Stream Carries Poison To Control Beetles In Trees

**New Method of Controlling Beetles
In Trees Announced Recently
By U. S. Forest
Service**

Trees doomed to die from insect attack may help save neighboring trees from the same fate. The only practical way previously devised for controlling bark beetles—a serious threat to American forests—is the destruction of trees into which large numbers of beetles have tunneled. These trees usually are felled and burned, or their bark is peeled off and burned—a costly method.

Searching for new and better control measures, entomologists of the U. S. Department of Agriculture have worked out promising methods for introducing into the sap stream of an infested tree chemicals poisonous to the insects. The rising sap carries these chemicals—zinc chloride and copper sulphate—all through the tree, impregnating the tissues much more simply and at far less cost than could be done with an outside force.

Besides killing all insect life in the tree, the injected fluid makes the wood immune to further insect attack. Treated trees, therefore, may be left standing for several years, until it is convenient to start logging operations in their vicinity. Furthermore, posts, poles, and logs in the ground from the treated trees will resist insect attack and decay that soon ruin untreated timber in contact with the ground. As a method of preserving forest products, the entomologists say, these treatments can not take the place of commercial dipping and pressure processes. They are, however, practical for farmers and foresters needing rough timber for fences or for rustic furniture, cabins, or bridges on the land where the trees grew. Nor can these methods of destroying insect pests be used on trees to be kept alive. They are bound to kill the tree, as well as the beetles in it.

Zinc chloride and copper sulphate have given the best results in the department's tests for the last 10 years. Zinc chloride is somewhat better than copper sulphate, as the copper salt corrodes any metallic object—such as nails—brought in contact with it.

Early attempts to introduce the salts by boring holes in the tree trunk and connecting these holes with a reservoir containing the solution did not work very well. Sap rises in such narrow channels, with so little sidewise movement, that the injected fluid ascends in narrow bands that affect only the limbs directly over the point of injection. Now the chemicals are introduced around the entire circumference of the tree.

(Continued on Page Five)

SIXTH DISTRICT

**W. G. Wallace, Dist. Forester,
Savannah**

SOUTHEASTERN SECTION S. A. F. MEETING IN SAVANNAH

Chairman Harold S. Newins, Gainesville, Florida, has called the annual meeting of the Southeastern Section meeting of the Society of American Foresters in Savannah on January 15th and 16th. A large attendance is expected, and elaborate plans are being made for entertainment of those attending. Governors-elect Cone of Florida and Rivers of Georgia are expected to attend, as well as many other persons from several southern states representing varied interests connected with forestry.

A "Caucus and Smoker" is planned for Friday night, Jan. 15th, followed by a business meeting of members only at 11:00 A. M., Saturday, luncheon at 1:00 P. M., trips through the plant of the Union Bag & Paper Corporation, and Dr. Chas H. Herby's Pulp & Paper Research Laboratory. Other interesting features are planned, followed by a big banquet at the Hotel Savannah on Saturday night.

OGEECHEE T. P. O. PLANS PURCHASE OF NEW FIREBREAK PLOW

Announcement is made by Mr. Elliott Reed of the Ogeechee T. P. O. that several hundred dollars have been contributed by local persons and industries dependent on our forests, and that an order for a fire-break plow will be placed at an early date. The principal handicap is a lack of suitable plows to select from. The new plow designed by the Florida Forest Service is favored, but early enough delivery is questionable.

The Ogeechee T. P. O. has had notable success in fire protection largely due to the intense patrol and lookout system used and to its educational activities. The CCC has been a major factor of course. But much credit is due to the aggressive leadership of this organization, and its management through Mr. Perry Hubbard, T. P. O. Manager. Of particular interest is a new innovation whereby important forestry matters, etc., are discussed with the entire T. P. O. membership through weekly mimeographed letters, articles, etc.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

The T. P. O.'s in the Waycross District now receiving assistance from the counties in which they operate are as follows: Consolidated, Appling, Wayne, Altamaha-Savannah, and Hurricane Creek. The increase

(Continued on Page Five)

T. P. O. NEWS

OGEECHEE T. P. O.

During the past three weeks additional material has been sent to members of the Ogeechee T. P. O., members of the Chatham Grand Jury, Principals of all Schools, Judges of Courts and County Police calling their attention to the great amount of damage done to growing timber by "FIRES". It is the aim to send more educational material to these people from time to time hoping that by constantly reminding them of the damage fire does to growing timber that many will change their attitude toward burning the woods.

Approximately 5,000 acres have been signed for organized protection recently.

Three towermen and five rangers have been added to the force employed by this T. P. O. All fire fighting equipment has been inspected recently in order that no bad equipment may be on hand as the fire season approaches.

New equipment is being purchased by this T. P. O. in order that work may be started on maintaining old fire breaks and the building of new firebreaks and truck trails.

GRAND BAY T. P. O.

In addition to the forest protection work being done by the enrollees of Camp Lannier, they are getting out material for the erection of a T. P. O. Office Building, which is to be constructed of cypress logs standing upright on a cement base. All of the material for this building, except the cement base, the flooring and the roof, will be gotten by the enrollees. The building is to be erected in the center of the City of Lakeland and will be made as attractive as possible.

CHEROKEE COUNTY T. P. O.

Cherokee County contains approximately 200,000 acres, of which approximately 170,000 acres are in timber. Of this acreage in timber it is estimated that 40,000 acres has a great amount of virgin timber on it. During the past decade many acres of original timber have been cut but a great part of this has receded and now has a nice growth of young, strong second growth timber on it.

The Cherokee T. P. O. is operated, at present, with six rangers and one regular patrolman. As a result of the efforts put forth to prevent forest fires there have been only four acres of timber land, under organized protection, burned during this season.

All of the rangers are conveniently connected by telephone, which makes it possible for a number of persons getting to the fires as quickly as possible, after they have been located.

SEVENTH DISTRICT

(Continued from Page Four)

ing interest shown by the several counties in fire protection work is indicative of the progress that we are making toward obtaining 100% protection for the entire Slash Pine belt. The decrease in the number and size of fires in this section in the past two years has been very noticeable, even to the people residing in the towns and cities, and after reviewing the records for the past few years it would be "just" to give credit to the Timber Protective Organizations for this reduction in fire damage.

T. P. O. ACTIVITIES

The Consolidated T. P. O. recently purchased three new pick-up trucks to be used as patrol trucks. These trucks are to be equipped with radio receiving sets and are to receive fire calls and instructions from the broadcasting station located in Homerville and owned by the T. P. O.

A new lookout tower has been recently completed by Camp P-65, Jesup. This tower stands on the lot bought by the Wayne County T. P. O. for their T. P. O. headquarters and it is planned to start work on the headquarters at an early date.

The Camden County T. P. O. recently purchased a new tractor as the demand for secondard firebreaks together with the maintenance of ECW firebreaks and truck trails was too much of a load for one tractor.

The Wayne County T. P. O. had to lease another tractor and plow until the time their new tractor and plow arrived. Demand for secondary plowing is heavy in this T. P. O. area.

Tre Consolidated T. P. O. and the Appling T. P. O. are planning on renting, or leasing, another tractor in order to perform the work that is now demanded of them. It seems that the majority of the T. P. O.'s in this section need two tractors to operate their plows and graders so as to keep ahead of the work required.

SAP STREAM CARRIES POISON TO CONTROL BEETLES IN TREES

(Continued from Page Four)

A tree to be treated must be green and its crown must be left intact during the treatment. The simplest method—adapted to small trees—is to cut the tree off at its base, lodging the top in the crown of another tree, or in some other support to keep it upright, and set it in a pail of the solution. With trees too large to handle this way, the bark is removed from around the base. Then a notch is sawed through several layers of wood in the center of the smooth, bark-free strip and a wide rubber band is stretched around the notch. The solution is run under the band into the notch.

Concentrations of 1 pound of the powdered chemical to ½ gallon of water for each cubic foot of wood in the tree stem have proved most satisfactory. The time required for the treatment varies with the physiological activity of the tree, par-

ticularly the rate of transpiration. On a bright, sunny day a gallon or two of the solution will be taken up in one to three hours; in cloudy or cool weather, 24 hours may be necessary for complete absorption. Distribution of the chemical to all parts of the sapwood takes 5 or 10 days longer.

The department's experiments have been confined to a few tree species, principally pine, spruce, fir, oak, hickory, and yellow poplar. The entomologists believe, however, that all species, except those with excessively thick or irregular cell masses, such as black locust and white oak, can be treated in this way.

The usefulness of tree treatments for insect control in the Southeast is limited because of the rapid growth of fungi—the so-called blue stains—introduced by southern pine beetles when they attack short-leaf pines. Permeating the outer layers of sapwood within five days to a week, these fungi prevent the effective distribution of the chemical. In Idaho and Montana, however, the mountain pine beetle can be controlled successfully by treatments started 60, or even 90, days after it attacks white pines.

Green, healthy conifers may be treated at any time of the year except in freezing weather. The chemicals are absorbed most rapidly in the growing season, however. Hardwoods readily take up the chemicals during the active growing season. After the leaves have fallen treatment is possible, but it takes longer and results are not so uniform.

STREAM GAGING EXHIBIT

An exhibit of much importance to the future prosperity of Georgia has recently been installed by State Geologist Richard W. Smith in the State Museum, on the fourth floor of the Capitol. This exhibit, by means of posters and pictures, points out that Georgia is the only state in the Southeast and one of five in the United States that is not cooperating with the United States Geological Survey in measuring the flow of her streams. The need is shown for long-time stream flow records in planning for industrial water supplies, such as those needed by large paper mills, municipal water supplies, designing of bridges and highways, water power, flood prediction and control, soil erosion control, drainage, and navigation. The exhibit also shows the methods by which these necessary facts are obtained and the plan for stream gaging in Georgia if the Legislature should make to the Department of Forestry and Geological Development a minimum yearly appropriation for this purpose of \$15,000.

One poster in the exhibit asks the question "Is Georgia a Backward State?" and points out that in not establishing stream gaging stations to measure the flow of her streams, as is being done in all the surrounding states, Georgia is backward. Ask your legislator if he has seen this exhibit.

FOREST

C. C. C. CAMP NEWS

P-59

Much progress is being made in improving the educational program in the little Red School on the banks of the Suwanee. The wood shop is being equipped with a lathe, a bench saw, a drill press, a bench planer and a saw. Two new class rooms have been partitioned off, a book case built, a magazine rack constructed and eventually we will have an up to the minute educational program down on the edge of the Okefenokee.

The enrollees are taking a great deal of interest in the program under the efficient guidance of Mr. Don E. Zimmerman, who recently reported to Fargo, as Educational Adviser. A program is being worked out also for the side camp at Tarver.

At the last meeting of the Educational Committee, which consists of Mr. Zimmerman, Mr. T. L. Hughston, Project Superintendent, and Capt. Bowen, Company Commander, it was decided to offer prizes for the best attendance and the most progress in class work.

While assisting in making the Type Map several of the enrollees became interested in the subject of land surveying. Capt. Bowen volunteered to teach a class in this subject and will soon start to actually put into practice the things being taught in the class, by mapping the camp.

It is expected that as soon as the woodshop is completed most of the boys will be found in that portion of the camp making various wooden articles under the guidance of Mr. James Fason, one of the Forestry Foremen.

This area has, for the year 1936, established a very low figure for acreage burned. Up to the present date less than 70 acres of timberland have burned and this Camp has furnished only 142 "man days" for fighting forest fires. When one recalls the records of 1933-34, this seems almost incredible, but the combination of an all time tower service, active patrolmen that can be dispatched to a fire by radio and efficient fire crews getting to the fires quickly has made it possible. As more truck trails are built, which will make all parts of the area easily accessible, we hope that this fire loss can be kept to this low figure and even reduced.

P-62

Sweetwater Creek Bridge

Camp P-62 has just completed a six hundred foot bridge over Sweetwater Creek on Truck Trail number 7-D-32 between Southern Industrial Orphans' Home and Red Oak School. This bridge is composed of forty 15 foot spans and is constructed of pine

and cypress timber. The piling were driven to an average depth of fourteen feet by a Government owned pile driver.

The funnels on this pile driver were furnished by Mr. T. L. Hughston, Project Supt. P-59, Fargo, Ga. They are 12" x 12" timbers fifty feet long. The leads are 6" x 6" x 36 feet long giving the one ton hammer and follow block a clear drop of twenty eight feet which allows a piling of that length to be swung into the leads and driven. This machine is powered by a double drum gasoline hoisting engine.

The piling for this bridge were cypress of an average diameter of 12 inches. The caps are 12" x 12" timbers hewn out by hand and are almost 100% heart pine and cypress. The entire structure was painted with creosote with special attention being given to the hand rails which were of only sound and square edge material.

This bridge connects two large areas of timber which have heretofore been a road distance of eleven miles apart when the actual distance was only one and one-half miles. Fire reports from the towers were not accurate enough to determine which side of the Creek the fire was located on and several times a fire has spread to enormous proportions because the fighting equipment was directed to the wrong side of the Creek at first. With the bridge now completed it is not difficult to reach a fire on either side of the Creek.

P-68

The Fitzgerald Side Camp from P-68 was abandoned by December 18th and moved back into the Base Camp at Douglas.

Construction has been started on two truck trails in Bacon County, 8-B-1 beginning at State Route No. 32, one-half mile east of Guysie and running South 3.3 miles to a county road which will connect Beach. Truck trail 8-2-X beginning at Beach and running West 4.1 miles to a county road between Nichols and Bickley will also be started. This truck trail will make a large area accessible for fire suppression that is now impassable.

Materials have been procured for 210 feet of bridging on Truck Trail A-3 in Jeff Davis County over Hurricane Creek, construction to start in January.

Forest Service Quarters building is being sealed preparatory to winter weather. Alterations are being made inside at the same time to give more attractive and convenient living accommodations.

The Company Commander has offered a \$10.00 prize for the hut showing the greatest improvement over a period of twenty-one days beginning December first. Originality is the governing factor in awarding points. The huts are inspected daily and graded according to the daily improvement. The hut showing the greatest improvement in any one day is awarded a flag for that day. Needless to say, rivalry is very keen and all huts and grounds are

more attractive now than during any period of the Camp's history.

P-81

A program of camp beautification has been outlined for Camp P-81 and work on the project will begin as soon as weather conditions permit. Work on the program will be done on Saturday mornings and odd times. Slash pines will be planted along the borders of roads and walks. A number of natural shrubs will be transplanted from the woods to help beautify the grounds. In addition to the program for the immediate vicinity of the camp, a two-acre tract of land will be planted in slash pine.

Work in the Educational Department's workshop has been increased considerably with the nearing of the Christmas season. The men are working on small, attractive Christmas gifts such as floor lamps, table lamps, candle sticks, smoking stands, ship models, ash trays, book stands, what nots, cedar chest and chairs.

The work program at Camp P-81 will go on through the holidays with the men living farthest from camp getting off for Christmas holidays. Those who live within a few miles of the camp will be given off New Year's so that they may return on pay day and have their funds with which to make merry.

P-87

Enrollees at Camp P-87 are quite proud of the job they have done in rendering the "turnout" from the highway into the camp entrance road more nearly entirely safe. A bad situation prevailed at this turnout, until recently. The old County road that formed this "side road", originally dropped off from the highway on a sharp grade, and this fact, coupled with the further condition that the intersection is directly adjacent, to a five hundred foot bridge with a four foot high guard rail, produced a situation such that it was impossible for the driver of an outgoing truck from the Camp to see vehicles approaching along Georgia State Route No. 1, from the North. To relieve this situation, retaining walls ranging from four to fifteen feet high were built for a total distance of probably a hundred and seventy-five feet, and for a distance of sixty feet from the intersection, raised to a level with the highway. Some five hundred cubic yards of dirt were required for the fill, this was cherted, with a resulting smooth, all weather road, from which excellent vision is had in all directions. The State Highway Department kindly furnished us with all necessary warning signs, that is, "Side Road Right", and "Slow", for main highway, and two "STOP" signs for camp road. It is felt, now that all possible precaution has been taken, so far as construction goes, and that if all drivers exercise reasonable care, accidents can easily be avoided at this, for the camp, important intersection.

TRIPOLI DEPOSITS OF GEORGIA

GEOFFREY W. CRICKMAY

The name "tripoli" comes from northern Africa where a deposit of siliceous earth has long been known to occur near Tripoli in Italian Libya. This earth is made up mainly of the siliceous tests of minute plankton (diatoms), and the rock is thus sometimes called fossil flour or fossil meal. About 85 years ago siliceous earths were discovered near Dalton, Whitfield County, Georgia, during the construction of the Western and Atlantic railway, and these were used locally as an abrasive. Some 20 years later, in 1871, similar earths were mined in southwestern Missouri. They were called tripoli because they were erroneously thought to be similar to the well-known earths of Tripoli, from which they differ in containing no fossils and in being composed of chalcedonic rather than opalescent quartz. These differences are so fundamental that the two types of earth are now generally used for different purposes, but the name "tripoli" has remained with the Missouri earth while the African tripoli is known as diatomaceous earth or tripolite. Diatomaceous earth is known to occur in the Atlantic Coastal Plain but no deposit is known in Georgia. On the other hand, large deposits of tripoli are known in northwestern Georgia, and although these have not been extensively mined, their size and accessibility invite future development. This paper gives a general account of the properties of tripoli with comparative tests of Georgia material, followed by a description of the individual tripoli deposits of the State.

Siliceous earth is commonly called "soft" silica to distinguish it from finely ground quartz, called "hard" silica. The U. S. Bureau of Mines includes all the soft silicas under the general name of tripoli but in the trade two types of soft silica are recognized. The abrasive earths obtained mainly from Missouri and Oklahoma are called tripoli; the earths for filler obtained mainly in Illinois and Tennessee are called amorphous silica. Slight differences in physical properties have lead to widely different uses and consequently distinctions are made in the trade which are not generally recognized by the geologist. The usage of the U. S. Bureau of Mines is here followed, and tripoli or soft silica is divided into two types, the Missouri-Oklahoma and the Illinois-Tennessee types.

The Missouri-Oklahoma tripoli has a very low apparent specific gravity due to its extreme porosity. It is generally loosely coherent so that a slight pressure between the fingers reduces it to a powder of round spongy grains less than .01 mm. in diameter. These little grains are quartz, and are thus hard enough to scratch steel.

Their spongy character makes the coherent phases extremely absorbent, a property which recommends the material for filter blocks. The deposits occur in horizontal beds interstratified with limestone which may be partly replaced by chert. The predominant color is cream and pink but various shades from ivory to red are found.

The Illinois-Tennessee tripoli (amorphous silica to the trade) is not amorphous silica but is chalcedonic quartz with cryptocrystalline structure. The grains are very similar in appearance to the Missouri earth, but are commonly of smaller diameter (average diameter of grains is said to be about .002 mm.). The material is commonly compact and not highly porous. Pure white tripoli, rare in the Missouri-Oklahoma area, is common in the Illinois-Tennessee fields.

The Georgia tripoli compares most closely with the Missouri-Oklahoma material which it closely resembles in shape and size of grains. The grains are composed of chalcedonic quartz. The color of Georgia tripoli is generally lighter than the Missouri earth; many deposits include a large amount of ivory to white tripoli.

According to the U. S. Bureau of Mines, total tripoli production in 1935 was 27,375 short tons valued at \$383,416, with average value of \$14.00 a ton. This is nearly 7,000 tons more than that produced in

1934, but the average price is \$2.00 a ton less. Crude tripoli generally sells for less than \$6.00 a ton at the mine; the average price of crude in 1935 was \$2.25 a ton. Refined and classified tripoli ranges in price from \$8.00 to \$40.00 a ton.

Tripoli is used mainly as an abrasive, and 37 percent of the 1935 production was put to this use. The Missouri tripoli is particularly suited for buffing and burnishing. Tripoli is the abrasive agent in many scouring soaps and powders. The next most important use is as a filler, and 18 percent of the 1935 production was put to this use. Soft silica is extensively used as a filler in special paints, in the manufacture of rubber, and in refractory cements. About 11 percent of the 1935 production was used for admixture in special cements and concrete. Compact phases of the Missouri tripoli are quarried in blocks cut to desired shape and size for filtering water, but according to the U. S. Bureau of Mines nearly all such products are now exported. In the past, tripoli has been used in large amounts as a parting sand for castings, but in 1935 this use accounted for less than 10 percent of total production due presumably to both the small output of foundaries and the use of ground silica and other competitive products in place of tripoli.

The chemical composition of tripoli is

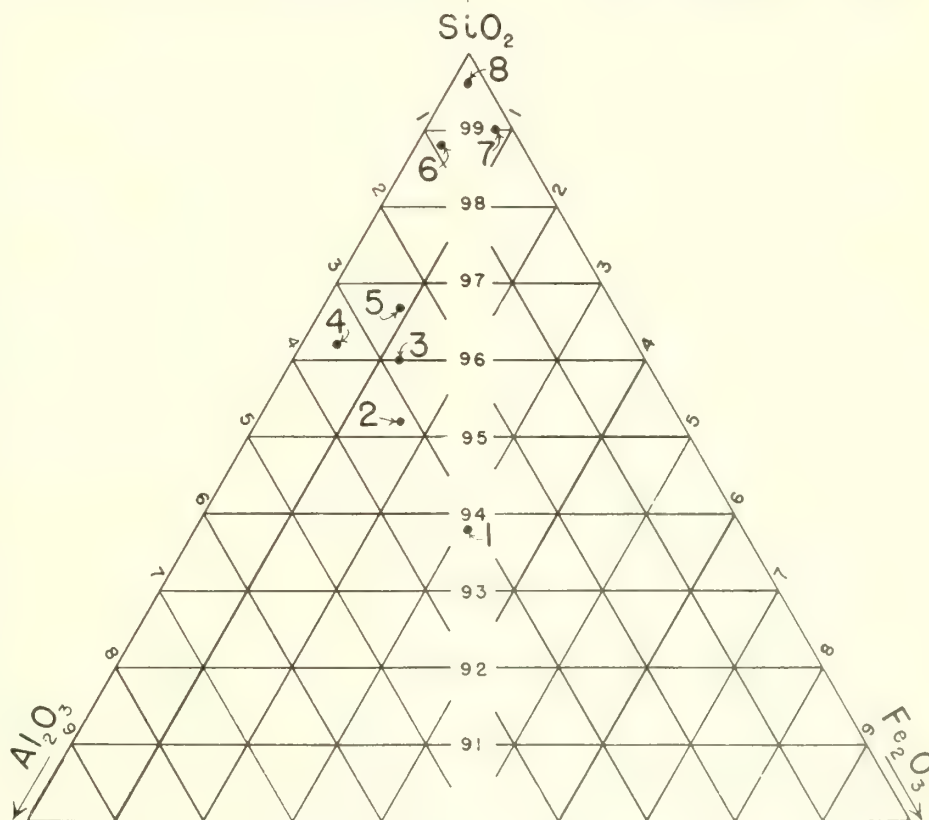


Figure 1—Diagram showing proportion of silica, alumina, and iron oxide in tripoli (analyses of Georgia tripoli by Edgar Everhart). The apex of the diagram represents 100 per cent silica; for example, number 8 contains 99.6 per cent silica and very little iron or alumina; number 1 contains less than 94 per cent silica and nearly equal portions of iron and alumina. 1—Old Bobo place, Floyd County; 2—L. J. Vaughn, Catoosa County; 3—G. B. Hulme, Bartow County; 4—J. R. Heistand, Bartow County; 5—W. H. Boss, Walker County; 6—Missouri cream tripoli; 7—Missouri rose tripoli; 8—Illinois tripoli.

distinctive. Good grades average more than 95 per cent silica and commonly more than 98 per cent. Iron is generally present as the red or brown oxide. It does not exceed 2 per cent in pink varieties and is less than 0.2 per cent in white and cream varieties. Combined water, mainly in clays, amounts to less than 0.5 per cent. Clay up to 5 per cent is not considered an impurity for it seems to impart certain desirable qualities. The alumina content, generally less than 2 per cent, gives some measure of the amount of clay present. A series of analyses in graphic form is presented in figure 1. Here is shown the similarity of Georgia tripoli with commercial grades from Missouri and Illinois.

There are no accepted standards for tripoli principally because many of the physical characteristics are not susceptible to measurement and specifications are different for each use. The material marketed by the largest producers in Missouri and Illinois has become "standard" only by custom. Consumers are mainly large industrial concerns who select a particular type of tripoli by trial and error. Newly found deposits are slow in development because the consumer, lacking any standard of comparison, is generally unwilling to change to a different earth. This study has shown that some of the Georgia tripoli is similar in many respects to the "standard" Missouri tripoli, but Georgia producers have found considerable difficulty in marketing their product.

Figure 2 presents the results of screening tests on Georgia tripoli, showing size distribution of grains. The lump material was first carefully broken down in an iron mortar, then rolled on paper, so as to loosen the individual grains without breaking them. A sample of white tripoli from Lyerly was more completely ground in the iron mortar to find out how much error was possible in the pulverizing method. The histogram of this material shows that this error is small, and that the diagrams are accurate enough for comparative purposes. The Georgia tripoli is shown to be generally coarser grained than the Missouri earth. Some deposits, such as that on the Hamilton place near Dalton, are composed of grains of nearly equal size, but in others there is considerable range in size.

Tripoli is mined by both underground and open-cut methods. Many of the Georgia deposits are covered by 2 to 6 feet of overburden and can thus be mined by surface methods. Under-ground methods have been used in Walker and Whitfield counties but the mines are now abandoned and inaccessible. The crude tripoli is hand picked and generally classified into two grades, white or cream, and pink. It is dried for shipment without further separation. In Missouri and Illinois milling methods involve crushing, pulverizing, and classification by screens and air separation. Both wet and dry methods are in use. The satisfactory development of the Georgia

tripoli deposits will be dependent on the erection of modern mills to insure some uniformity of product.

Tripoli occurs in the following counties; Bartow, Catoosa, Chattooga, Floyd, Gilmer, Murray, Polk, Walker, Whitfield. It has been mined mainly in Chattooga, Walker and Whitfield. Most of the deposits occur in the upper part of the Knox dolomite (Cambro-Ordovician), and are associated with chert layers. Tripoli also occurs in association with the Bangor limestone (Mississippian), Shady limestone (Cambrian), and Murphy marble (pre-Cambrian).

The origin of tripoli is debatable. Some deposits, such as those in Bartow County, are found to grade downwards into unaltered siliceous rocks such as novaculite. Most of the Georgia deposits, however, change very little with depth. The deposit near Harrisburg has been prospected by auger hole to a depth of 65 feet, and no appreciable change in coherence has been found. Some geologists argue that tripoli has been formed by disintegration of chert (a siliceous replacement of limestone) but gradations between chert and tripoli are not known in Georgia. Many of the Georgia deposits occur apparently at a definite

horizon high in the Knox formation suggesting that the siliceous character of the beds may perhaps be original, for intense silification of this peculiar type is not likely to occur at one horizon over a wide area. In some places (noted particularly at the deposit near Dalton, Whitfield County) silica has been introduced into the tripoli and now forms narrow veinlets along joints and bedding planes. Two general theories seem plausible. One holds that the tripoli originates from decomposition of limestone containing silica which was deposited at the same time as the enclosing rock; the other maintains the silica was introduced at a later date by solutions, possibly hydrothermal. No definite evidence favoring either one of these theories has been obtained in this study.

The above account will be republished as Information Circular 9 which will also include a description of 12 properties in northwest Georgia where tripoli occurs.

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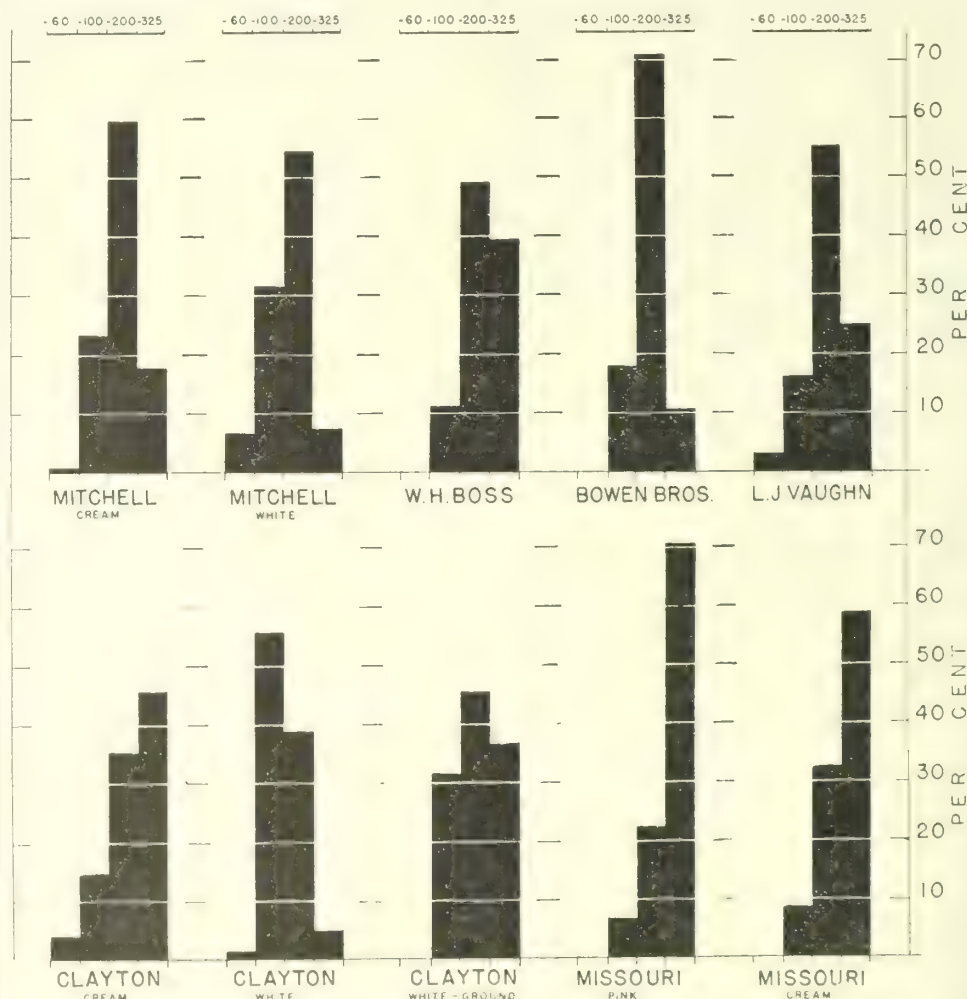


Figure 2—Diagram showing percentage grain-size distribution (histogram) of tripoli from Georgia and Missouri. Minus 60-mesh is less than .246 mm. in diameter; minus 100-mesh is less than .147 mm.; minus 200-mesh is less than .074 mm.; minus 325-mesh is less than .043 mm. Georgia tripoli is listed by property owners for which see description of deposits by counties.

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No. 2

CCC CAMPS IN GEORGIA COMPLETE MANY WORTH WHILE PROJECTS DURING PAST TWO YEARS—MANY MORE TO BE COM- PLETED DURING PRESENT PERIOD

LARGE NUMBER OF MAN-DAYS SPENT IN FIGHTING FOREST FIRES — REMOVING FIRE HAZARDS — CONSTRUCTING TELEPHONE LINES — BUILDING BRIDGES

The C. C. C. Camps under the supervision of the Georgia Forest Service have carried on a number of worth while activities and have completed many projects that will be of material benefit to the timber owners of the State. A summary of the activities of these camps during the past two years is given below:

Bridges constructed	405
Bridges maintained	13
Lookout towers constructed	36
Lookout towers maintained	17
Other buildings constructed	11
Miles of telephone line constructed	775
Miles of telephone line maintained	642
Signs erected	177
Tool boxes constructed	31
Miles of truck trail constructed	750
Miles of truck trail maintained	724
Acres planted in trees	277
Acres of forest stand improved (thinning)	285
Man-days on nursery work	680
Bushels of cones collected	4076
Man-days fighting fires	17,647
Miles of fire breaks constructed	2,707
Miles of fire breaks maintained	1,420
Miles of roadside and trailside fire hazard reduced	317
Acres of other fire hazard reduc- tion	40,515
Man-days on fire suppression and fire prevention	4,240
Acres of tree insect control	395
Acres of carpet grass planted	8,915
Man-days searching for missing per- sons	63
Man-days emergency work on flood protection	1,537
Number of experimental plots de- veloped	7
Man-days drafting timber type maps	661
Miles of grade lines surveyed	47

Miles of linear surveys	8,088
Acres of timber type survey	5,280,757
Rods of fence erected	560

During the 8th Work Period the camps under the supervision of the Georgia Forest Service have initiated many new projects, as well as completed a number of the old projects begun in 1936. Projects that have been approved and have had a great amount of work done on them thus far are; the completion of truck trails, fire breaks and telephone lines, with the construction of many miles more; the building of many bridges and culverts; the gathering of pine cones to supply seed for the State nurseries; the construction of radio detection systems and type mapping of several million acres of forest area.

One of the most important phases of forest protection is fire detection. In order to detect the fires as quickly after they begin as possible, two radio detection systems have been installed, which include two Radio Transmitters located at Fargo, and Homerville, Georgia. These transmitters are connected with many telephones throughout the surrounding area, located in towers. When a fire occurs, the man located in the towers immediately call the broadcasting station. The station then sends out the alarm which is picked up by receiving sets that have been installed in all trucks throughout the territory, thus enabling the truck drivers, with fire fighting crews, to reach the fire more quickly. Plans of one of these camps call for the extending of the present telephone system to the extent that direct connection may be had with all sections of the T. P. O. area, the T. P. O. headquarters, the CCC Camp and nine towers.

After the fires have been detected, the

(Continued on Page 4)

PAVO HIGH SCHOOL STUDENT WINS GA. FORESTRY ASSO- CIATION PRIZE

TELLS VALUE OF HAVING STUDIED FORESTRY IN VOCATIONAL CLASSES

Raymond Hall, student in Pavo High School, is the winner of the first award of \$5.00 offered by the Georgia Forestry Association, writing the best article pertaining to his forestry programs at home or in schools. In telling of the value of this type of education Raymond mentions many activities being carried on by his school and himself for the improvement of forestry conditions in his community and on his own farm.

We are giving the article as sent to us by Raymond in this issue of the Review in order that the readers might learn of the splendid work this school and this student are doing in forestry.

BETTER FORESTRY PRACTICES STUDIED IN VOCATIONAL CLASSES

By
Raymond Hall

Each year forestry is included in the course of study of the vocational classes of our school. As a student in these classes it is my privilege and opportunity to study forestry, from several phases, as given to us by our vocational instructor.

In this instruction we are taught the improved methods of carrying out better practices pertaining to a number of jobs on our home farm and especially instruction as to the better practices of forestry conservation, protection and reforestation. We are also taught to develop a better attitude in the caring for our forests.

In connection with my home forestry project, as required by our instructor, I have planted 35 locust trees as an experiment. I hope to use these locust trees for fence posts. This is one of the lessons I learned in my forestry classes, that the locust tree is one of the most durable in contact with the soil. My main forestry project consists of two acres of slash pine.

(Continued on Page 2)

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

PETRIFIED FOREST IS FOUND RECENTLY NEAR TOWN IN OREGON

Another petrified forest in Oregon was recently discovered in Harney county by Alfred L. Brown of Burns. This previously unreported fossil wood forest, presents some 80 trees, many standing in their original vertical positions, and often 6 feet and more in diameter. Several excellent specimens of the colorful wood were brought to Portland by Brown, for cutting and polishing, and the material was found to be highly suitable for this purpose.

The petrified forest appears to have been covered by a shower of volcanic ash and then later by thick flows of Miocene lavas, which have preserved and protected the trees from destruction through the millions of years elapsed since the trees lived.

No detailed study of the area has been made, but Dr. H. C. Dake of Portland identified several species of oak, pine and swamp cypress in the specimens brought by Brown. The cypress would indicate that Harney county some 10,000,000 years ago had a warm, moist and semi-tropical climate.

—The Oregon Forest Log.

BETTER FORESTRY PRACTICES STUDIED IN VOCATIONAL CLASSES

(Continued from Page 1)

In order to get these pines on my project I gathered my own seed, prepared and made a seed bed and raised my own seedlings. This cost me very little money. These seedlings are now doing fine and within a few years I expect them to be at a size that I can realize some profit from them.

I have another seed bed planted this year. I plan to enlarge my project and will use these seedlings in carrying out this undertaking. Thus far I have gathered 15 pounds of slash pine, of which I planted my seed bed, with part, and sold the remainder.

Forestry determines the future of many of our southern homes and efforts are being made, not only through my vocational school but others throughout the State, to bring back and preserve the farm wood lot. The home forestry projects being conducted by the vocational students will supply the timber in the future for the farm needs for building, fence posts, fuel, repairs of many kinds and other uses. These projects do not occupy the best land on the farms but are planted in areas that are inclined to erode, thus serving for another purpose, that of preserving the soil.

LUMBER PRODUCTION INCREASE NOTED DURING 1936

NUMBER OF LATHS AND SHINGLES LARGER IN 1935 THAN EVER

During 1935 there were 855 active mills operating. The aggregate number of board feet of lumber produced by these mills was 713,878,000, of this amount 632,242,000 board feet were from soft wood, with 21,021,000 board feet from cypress.

Lumber production in the United States in 1935 showed a marked increase over 1934, according to preliminary figures compiled from data collected in the annual Lumber Production inquiry, released today by Director William L. Austin, Bureau of the Census, Department of Commerce.

The total lumber cut reported for 1935 amounted to 19,158,601 M feet, a gain of 23.7 percent over 15,493,639 M feet for the preceding year. The output of lath increased 48.4 percent, from 416,308 thousands in 1934 to 617,651 thousands in 1935; and the production of shingles increased 26.8 percent, from 3,477,062 squares to 4,407,898 squares.

Of the total lumber production in 1935, 30 percent, or 5,741,117 M feet, was contributed by yellow pine. This kind of wood was sawed in 19 States, of which seven—Alabama, Arkansas, Georgia, Louisiana,

FOREST C. C. C. CAMP NEWS

P-81

The slash pine planting and thinning program of P-81 is now under way. Fifteen acres of thinning projects were completed recently. Thirty-three acres are yet to be thinned. Approval has been granted for the planting of ninety-two acres during the coming season. Twenty-two acres have already been planted.

The planting and thinning programs have afforded an opportunity for foremen to teach enrollees some very important lessons in forestry. The planting projects will be completed during the month of February.

Both nursery and home-grown plants are being used. The reason for this is to demonstrate the difference in growth between nursery stock and stock from the woods. The stock from the woods is used on the camp premises in the beautification program. The nursery stock is planted in an adjacent field to the camp grounds.

With the arrival of nineteen new enrollees, the camp officials have been able to complete some very attractive improvements in the camp area. Painting, grass planting, building, repairing, as well as tree planting, have all been going on recently, with the help of the new men, in the camp beautification program and have made great progress.

A survey of the new enrollees reveals that not one had completed high school. Only three of them had passed the seventh grade and four could not write their names—which means more work for the educational department.

The personnel of the camp celebrated President Franklin D. Roosevelt's birthday by having a dance. Each member of the camp was only too glad to cooperate with the President, in this capacity, for the purpose of helping those afflicted with infantile paralysis.

The fire records of Camp P-81 indicate that the citizens throughout the community are rapidly becoming conscious of the value of their timberlands. Since the establishment of the camp, the number of acres burned from month to month has decreased more than 75 percent. The month of January, usually interspersed with many fires, has had only two small fires on record to date.

During the month of October 1936 there were 4300 tight staves, valued at \$460.00; hoe, fork, shovel, broom and other long handles, valued at \$7,781.00, exported through the Customs Office, Savannah, Georgia.

Mississippi, North Carolina and Texas—reported more than 500,000 M feet each.

FORESTRY EDUCATION IN VOCATIONAL AGRICULTURAL SCHOOLS IN GEORGIA

INTEREST OF STUDENTS AND TEACHERS INCREASING— MORE TIME DEVOTED TO THIS SUBJECT—A LARGER NUMBER HOME PROJECTS IN FORESTRY THAN EVER

Georgia has the most unique and practical method of teaching forestry now in operation in the United States.

The "Georgia Plan" is the result of the cooperative efforts of the Georgia Forest Service and the Department of Vocational Education. This type of educational work is being carried on in more than 200 communities throughout the State. In each county high school, rural consolidated schools in Georgia, where a Department of Vocational Agriculture is maintained, forestry constitutes a part of the course of study. Not only are certain periods in the class room set aside for the consideration of forestry problems but each school has a "school forest," which is managed by the Department of Vocational Agriculture according to directions furnished by the Georgia Forest Service.

This cooperative program was begun eight years ago and was started primarily for the purpose of giving practical forestry training to boys throughout the State on jobs dealing with the conservation and development of our forest resources. The Division of Forestry furnishes teaching material and supervises the instruction given by the teachers of vocational agriculture, pertaining to forestry. This cooperative program includes the following:

1. Leasing of 10 or more acres of forest land by the school, on which correct forestry practices are carried out under the supervision of district foresters, in cooperation with teachers of vocational agriculture.
2. Teaching practical forestry to all farm boys enrolled in vocational agriculture.
3. Preparing and furnishing to teachers and pupils teaching material dealing with forestry.
4. Conducting a vocational forestry school camp. Free scholarships are given to one boy in each vocational school throughout the State for outstanding records in forestry work.

The camp is held each year in order to extend, under practical conditions, the teaching which has been carried on in the agricultural class rooms of the high schools. Instruction in the camp is conducted by members of the staff of the Division of Forestry, assisted by teachers of vocational agriculture.

As a result of this cooperative program during the past eight years, approximately 16,000 farm boys have been given practical training in many of the more common forestry problems with which farmers are confronted.

In order to assist in carrying out this program, teachers of vocational agriculture have been given practical forestry training by the district foresters and through special courses at the Agricultural College. Each year through this cooperative program, thousands of trees are planted by boys on their home farms and thousands of acres of forest lands are protected from fire. A strong sentiment for the protection and preservation of our forest areas on the part of a large number of farm boys is being built. In fact, the boys being reached through this program are the farmers and foresters of the future.

The accomplishments of the vocational schools during the 1935-36 school year are listed below:

	1936	1935
Number of Students studying forestry.....	2,972	1,253
Number of Hours devoted to Forestry per student.....	18	14
Pounds of seed collected.....	391	
Number of seedlings planted by Adult Farmers.....	463,294	12,848
Seed beds made.....	48	35
Number of Students with Home Projects.....	872	529
Teachers assisting with T. P. O. work.....	12	4
Number of column inches in newspapers.....	1,428	600
Miles of firebreaks constructed.....	2,620	592
Number of schools having forestry exhibits.....	25	10
Seedlings grown on school forests.....	41,544	14,580
Seedlings grown other than on school forests.....	979,777	

It is the plan during the coming year for the teachers of vocational agriculture to increase their accomplishments along certain lines. More seed beds will be established. More seedlings will be planted by the students and by the adult farmers. More students will study forestry. Consequently, the cause of forestry will be advanced in a large measure. More can be accomplished toward the conservation and protection of the forest lands of our State through this type of educational program than in any other manner. The students studying forestry in the vocational schools have expressed themselves, that they had rather have any other part of their educational program discontinued than that part which deals with forestry. Of the more than 200 vocational schools, in which this forestry program is being carried on, 45 are negro schools. Realizing that the negro as well as the white man can set fire to woods, the Division of Forestry thought it well not to neglect the negro children of the State and have cooperated with them on the same basis as the white schools. The negro teachers and students appreciate the cooperation and consideration that the Division of Forestry has shown them during the past several years. These teachers have been instrumental in

planting a large number of seedlings and reducing the number of forest fires in their local communities. They have shown a splendid spirit and have been willing to carry out the suggestions in every detail as have been given them by the Educational Department of the Division of Forestry.

Vocational Forestry Camp. Each year a vocational forestry camp is conducted. The students attending this camp are selected on the basis of a competitive examination in forestry. The object of the camp is to bring together, annually, outstanding boys showing particular interest in forestry, to receive more intensive training in practical forestry under the guidance of a staff of trained foresters of the Division of Forestry. Those who successfully complete the camp are given a vocational forester's certificate. Many of the students attending the vocational forestry camp have been given non-technical jobs by different forestry enterprises. Some have been assistant technicians in the forest survey conducted throughout the South by the U. S. Forest Service and others have obtained positions as foremen in several of the

C.C.C. Camps in Georgia. In every instance, these students have proven themselves to be well qualified and have shown more ability than those who did not receive the vocational forestry course.

FIRST PAPER BAG SHIPMENT THROUGH SAVANNAH CUSTOMS OFFICE OCT. 1936

VALUE OF THIS SHIPMENT MORE THAN \$7,000.00

The month of October 1936 is the first period showing export of paper bags as a separate item of export through the Georgia Customs District, Savannah, Georgia. During this month more than \$7,000.00 worth of paper bags were exported.

The initial shipment was made to Cuba, although this commodity is shipped to a considerable extent to foreign countries. Most of the shipments, according to report, are made through other Custom Districts. A large percentage of the total number of bags manufactured within the vicinity of Savannah are for export.

FOREST FIRE RECORD FOR GEORGIA 1935-36

FEWER FIRES AND LESS ACREAGE BURNED ON PROTECTED AREA

An improvement in forest fire protection is noted for 1936 as compared to the year 1935, especially on land under organized fire protection.

During 1935 there was a total of 2401 fires on protected areas in Georgia as compared with 1411 in 1936. The percentage of protected area burned in 1935 was 6.24 as compared with 2.6 in 1936. During 1936 there were 284,726 acres under organized protection burned, while in 1935 there were only 87,623 acres burned on timber land in timber protective organizations. Comparing this with the number of acres burned on unprotected areas one cannot fail but see that organized protection pays.

In 1935 there were 2,423,630 acres of unprotected land burned; during 1936 there were 5,654,700 acres of unprotected forest burned by fire. It is very noticeable, from studying these figures, that not only the number of forest fires decreased during 1936 and the number of acres burned on protected land was decreased, but that the number of acres burned on unprotected areas in 1936 was greater than the number of acres burned on unprotected acres in 1935. This is proof to anyone that the only method of controlling forest fires is through organized protection.

We are giving below the number of fires in 1935 and 1936 on protected lands by different causes.

CAUSE	1935	1936
Lightning	7	18
Railroad	55	80
Campers	21	49
Smokers	24	41
Debris Burning	98	142
Incendiary	1211	479
Lumbering	22	39
Unknown	31	194
Miscellaneous	932	369
	2,401	1,411

CCC CAMP ACTIVITIES

(Continued from Page 1)

next most important phase of forest protection is getting to them. During the coming work period, many man-days will be spent in constructing and extending truck trails. In the construction of these truck trails, careful consideration is given as to their location, always choosing locations for their strategic value in opening up isolated areas of timber land and areas which have been practically closed due to no county or state road. It is the aim in all cases to provide such a system of truck trails that

all points in the area may be accessible at all times.

Plans of one of the camps in Georgia call for the construction of a permanent building that will be the office of the T. P. O. Secretary, a supply room and eventually contain a radio detection system.

During this period, the CCC Camp authorities will cooperate with the T. P. O. members in timberstand improvement. The project calls for the cooperation with any T. P. O. member to the extent that CCC labor may be used in the planting of seedlings on as much as five acres.

The type mapping of several million acres of timber land will be a very important project that much time will be spent on during the coming period. The enrollees are divided into surveying and type mapping units, consisting of twenty enrollees. These boys act as independent units, making traverses, taking notes and bearings, which are brought into the camp office and plotted by an enrollee draftsman. Strip mapping crews, consisting of four boys each, map the various areas.

In order to help the Georgia Forest Service secure seed for the two state nurseries, each camp is given a certain amount of pine cones to gather. These cones will be gathered during the eighth period. After they are gathered, they are to be sent to some centralized point for storage.

PRODUCTION AND EMPLOYMENT IN MANUFACTURE OF PULP INCREASED IN 1936

OUTLOOK BRIGHTER THAN EVER FOR PRODUCTION IN FUTURE

According to a report received recently from the Department of Commerce, Bureau of Census, both employment and production in the manufacture of pulp in 1935 showed substantial increases as compared with 1933.

According to preliminary figures compiled from returns of the Biennial Census of Manufactures taken this year the number of wage earners employed in pulp mills increased 17.7 percent, from 20,074 in 1933, to 23,623 in 1935, and their wages, \$23,401,212, exceeded the 1933 figure by 29.3 percent.

The total production of pulp (wood and other fiber) increased from 4,365,668 tons, valued at \$132,471,475, in 1933 to 5,050,856 tons, valued at \$166,343,506, in 1935, the rates of increase being 15.7 percent for quantity and 25.6 percent for value.

The total consumption of wood in 1935 amounted to 7,628,274 cords, costing \$58,243,652, of which 5,061,611 cords costing \$36,667,945, was contributed by yellow pine, domestic spruce and hemlock.

CONGRATULATIONS

Congratulations are in order to Mr. and Mrs. Stewart L. McCrary on the arrival of a daughter. The little daughter made her arrival Saturday, December 26, 1936. She has been christened Lucile.

News has reached us that Mother, Daughter . . . "and Father" . . . are doing nicely.

The personell of the Division of Forestry congratulate Mr. and Mrs. McCrary on the arrival of Lucile and are hoping that "all parties concerned" will continue to do nicely.

Mr. McCrary is employed by the Georgia Forest Service as a District Forester. He is located at Augusta, Georgia. Since taking the position of district forester for this section of the state Mr. McCrary has advanced the cause of forestry in a very noticeable degree.

SCHOOL MUSEUMS OF ROCKS AND MINERALS

State Geologist Richard W. Smith reports that interest is growing in the school museums of 75 common rocks and minerals of Georgia that are being distributed by the Division of Geology to high schools throughout the State. A museum has been offered to at least one high school in every county and 165 have already been placed and are receiving enthusiastic comment from the schools and the local communities. Several other schools are building the locked glass cabinets that are necessary before a museum can be placed. Other high schools to which a set has not been offered are finding out about these museums and are requesting them from the State Geologist.

The work of preparing these museums is progressing so rapidly that sets will soon be offered to about 50 more schools. Any accredited high school to which a museum has not yet been offered may receive one by making application to the State Geologist and by meeting the requirements, the principal one of which is that the school must furnish a lockable glass case in which to display the museum.

ADDITIONS TO GEOLOGICAL LIBRARY

The Division of Geology has in recent months added hundreds of new volumes to its geologic library by exchanging duplicate books for missing publications. In order to house this addition to its library it has been necessary to add shelves to the ceiling of the Division's office. The library will soon be one of the most complete geologic libraries in the Southeast, and will contain nearly complete sets of the reports of the U. S. Geological Survey, the U. S. Bureau of Mines, and of all state geological surveys, as well as many scientific journals relating to geology and mining. It is open to consultation by the general public.

FIRST DISTRICT

**T P. Hursey, Dist. Forester,
ROME**

During the past month, the District Forester has been engaged in an intensive educational program, visiting many sections and communities. During these visits, information has been given to the people pertaining to the best practices of forestry. Motion pictures have also been shown to the groups, illustrating the best practices of forestry conservation, protection and reforestation.

More than 2100 people have been contacted through these meetings and all have manifested much interest in the programs as they have been presented. Plans are in effect now to continue this type of educational work until as many citizens in our district have been reached as is possible.

SECOND DISTRICT

**W. D. Young, Dist. Forester,
Gainesville**

Enotah TPO

December 21st marked the closing of the Enotah Timber Protective Organization. This organization was one of the first created in the State after the Georgia Forest Laws were passed in 1925. The long and eventful life of this organization stimulated an interest in forestry and conservation among the people of northeast Georgia and has practically eliminated the practice of woods-burning in the two counties of Union and Towns, in which the organization was located. Mr. Bonnel H. Stone was the originator of the organization, being at that time and for several years after, the Manager of the holdings of the Pfister and Vogel Company located in Towns and Union Counties. Mr. C. C. Earnest of Blairsville has served as patrolman and for the past several years as Secretary-Treasurer of the organization. Due to the untiring efforts of Mr. Stone and Mr. Earnest, this organization has made an enviable record in keeping the burned acreage down to the minimum. The total burned area has averaged about 1 percent throughout the life of the organization. The original land area of the TPO embraced 200,000 acres and land owned by the Pfister and Vogel Company comprised the bulk of the protected area.

As a result of the purchase program of the U. S. Forest Service in north Georgia, which includes the buying of the total land holdings of the Pfister and Vogel Company, together with purchases of additional land owned by other members of the organization, it was necessary to terminate the activities of the Enotah TPO.

THIRD DISTRICT

**Stewart L. McCrary, District
Forester, Augusta**

The timber owners in district three who secured seedlings from the state nurseries have been planting them during the past month. Due to the rains that have occurred during the month very few of these seedlings have failed to live. Unless much colder weather comes during the remainder of the winter months, a large per cent survival may be expected.

Increased interest in reforesting idle and eroded land has been manifested in district three during the past year by a larger number of seedlings being planted than any previous year. The district forester has assisted, in every way possible, these timber owners in planting their seedlings and has encouraged other timber owners to reforest their idle and worn out lands.

Interest in organized fire protection is increasing to some extent. Many land owners who have not had their forest acres in organized fire protective organizations are beginning to see that this type of fire protection is the only sure way of protecting their forests from fire. Efforts are being put forth to induce these timber owners to sign their timber land in Timber Protective Organizations.

Assistance has been given to a number of teachers of vocational agriculture, giving information and material that will be of help to them in carrying out their forestry program.

FOURTH DISTRICT

**R. R. Evans, Dist. Forester,
Columbus**

During the past month much time has been spent visiting the vocational schools in district four. On these visits a practical demonstration has been given before the students studying forestry. These demonstrations have dealt with Surveying, Estimating Standing Timber and other important forestry practices that would be of benefit to the students.

On Saturday, January 9, the district forester attended a meeting of the teachers of vocational agriculture in Southwest Georgia, held at Plains. It was a privilege to have met with this group of teachers. The forestry program, as is being carried on cooperatively by the Georgia Forest Service and the Department of Vocational Education was explained to the group for the benefit of the new teachers, and assurance was given the entire group that the district forester was always ready to serve in any way possible to help the teachers in carrying on their forestry program.

Assistance has been given during the month to several farmers who are interested in operating private seed beds during the coming season. A number of interested timber owners have visited the state nursery at Albany, Georgia, with the district forester, in order to see the methods and equipment being used there.

With the establishment of a number of private seed beds in district four, it will be possible for a number of timber owners to reforest many idle acres during the coming year.

FIFTH DISTRICT

**Herbert C. Carruth, District
Forester, Macon**

It has been brought to our attention that an insect known as the "Pine Tip Moth" has been attacking the seedlings and young trees throughout this section of the State. It has been reported that several stands in middle and south Georgia have been attacked by this insect.

It usually attacks as a result of green wood being cut and left on the ground. The only feasible means of control is to rid the stand of infested trees.

During the past month, much time has been spent in the organization of TPO Organizations in Crisp and Wilcox counties. We are hoping that many acres will be signed for protection in these two counties and that the TPO's will materialize by organizing soon and making definite plans as to the carrying on of organized forest protection.

SIXTH DISTRICT

**W. G. Wallace, Dist. Forester,
Savannah**

The Southeastern Section, S. A. F., held its annual meeting at the Hotel Savannah on January 15-16th with an attendance of over one-hundred foresters and citizens deeply interested in forestry from Georgia, Florida, South Carolina, and Alabama. Keen enthusiasm and interest was noted throughout the two day session.

Following the well attended business meeting on Saturday morning the plant of the Union Bag and Paper Corporation, and the Savannah Pulp and Paper Research Laboratory of Dr. Chas. H. Herty were visited. Needless to say, this was an important feature of the meeting. In fact, the subject of pulp and paper mills and their effect on forest practices was the subject nucleus of the meeting.

The banquet on Saturday night at the Hotel Savannah was the high-light of the meeting. Mr. H. A. Smith, State Forester of South Carolina was the principal speaker. He made a most impressive talk, dealing with the necessity of the cooperation of
(Continued on next page)

foresters, business men, land owners, and pulp and paper mills in giving proper attention to the protection and perpetuation of our forests for future needs both social and economical. His sound logic and accurate figures made a lasting impression on his audience. Other speakers, including Dr. Chas. Herty, O. T. McIntosh, W. E. Dunham, B. W. Householder, J. H. Allen, and W. M. Oettmeier made brief but important comments covering important subjects related to forestry and forestry industries.

The next meeting of the Southeastern Section is planned to be held at Camp Oleedo near High Springs, Florida, in March.

SEVENTH DISTRICT

**Russell Franklin, Dist. Forester
Waycross**

T. P. O. General

The Wayne County TPO Secretary, Mr. E. L. Knight, and the district forester met with the County Commissioners of Wayne County at their first meeting of the year, and at this meeting a report was submitted to the Commissioners showing what had been accomplished by the TPO and the CCC Camp along the lines of fire protection. As a result of the report, which showed splendid progress in the past three years, the Commissioners gave \$500.00 to the TPO. This financial support of the TPO has become a definite part of the county program in Wayne county as shown by the fact that the county has been assisting the TPO for the past three years, and as the years pass the yearly total of the financial aid grows, showing without any doubt that Wayne County, through its Commissioners, believes that the protection of their forest lands pays dividends to the county.

EIGHTH DISTRICT

**H. D. Story, Jr., Dist. Forester
Albany**

Educational Meeting

Plans are being formulated for another meeting of the Vocational Teachers and Students from the Eighth District for the latter part of February, at which time they will be guests of the Albany Chamber of Commerce and the Department of Forestry and Geological Development.

This group will be carried over the Albany State Nursery where details will be given on all phases of Nursery work and demonstrations in Planting, Lifting, Selecting, Packing, and Bundling seedlings.

Last year for the first time a group of one hundred were entertained at Albany and much interest and enthusiasm was shown at the meeting. Plans are to have approximately 300 present this year.

New Packing Shed—Albany Nursery

The new packing shed at the Albany Nursery is nearing completion and due to the rush in getting out seedlings and lack of packing space this building has been pressed into use for several weeks to provide packing space. The building when completed will be 26 x 61 ft., and should provide adequate storage and packing space for the Albany Nursery for several years.

To date about one-half of the seedlings have been shipped from the Nursery and plans are to have all seed beds clear and ready for planting again by the 15th of February.

TPO Notes

TPO's in the Eighth District are going into their fire season with a very few fires to break into the daily routine work. It is hoped that as there has been practically no fires on protected land, the interest and public sentiment has reached a point where landowners will place more interest in his forest holdings, realizing the possibility of a future income and that this interest will persist.

T. P. O. NEWS

Cherokee County TPO

The Cherokee County TPO has had unusual success as to the number of fires during this season.

The finances of the TPO are in good shape. At the beginning of the third quarter, all bills were reported as being paid, leaving a small balance in the treasury.

An educational program will be conducted during the third quarter, making contact with as many groups and schools as is possible and giving to them information pertaining to the advantages of forest fire protection and the better methods of forest conservation and reforestation.

Motion pictures will also be shown in these groups, illustrating these new methods. In this manner, we hope to contact a large number of people who could not otherwise be reached and are looking for much good to come from this type of educational work.

Wayne County TPO

Mr. Esmond Knight, Secretary of the Wayne County TPO, reports that 600 miles of primary firebreaks and 1000 miles of secondary firebreaks have already been built this season. Three thousand miles of secondary firebreaks will be maintained.

More than 100 miles of truck trails have been established through forest areas in the TPO, in which there was no other way of approach. These truck trails also serve as primary firebreaks. In the building of these truck trails through areas that have not heretofore been accessible, it is possible to suppress fires that otherwise would have burned over a large area.

STATE PARK NEWS

C. C. C. CAMPS

SP-2

Despite a minimum camp enrollment, remarkable progress has been made during the winter on Georgia's mountain park.

The borders of the lake are being carefully landscaped and the forest seems to have adopted this great artificial improvement as its own. A few ducks have discovered it and it promises to become a regular stopping place on their annual migrations.

The stone ledge at the crest of the gap is practically completed. Already the unfinished native stone building shows promise of being an adequate place of reception for both Georgians and tourists that visit Georgia's mountain.

Every detail will blend with the natural color of the mountain country. Much improvement is also being made on the roadway that approaches the camp.

From the number of requests for accommodations made last summer, park officials will find it hard to provide accommodations for those visitors who wish to come during the coming summer.

The park is picturesque at all seasons but the most popular is from May until October. It is very probable, with the frequent occurrence of heavy snows in the park, such as appeared last winter, and varying from twelve to fourteen inches in depth, and with six inches of ice on the lake, that it may become Georgia's playground for winter sports.

Historians have become greatly interested in the strategic location of the park for the presentation of the story of the significant and fascinating part played by this section in the history of Georgia and the Nation.

Intensive research is being carried on and the interest of a number of enthusiastic Georgians has already been secured. Led by the camp educational adviser, the camp enrollees will take an important part in this development. An interesting presentation may be given in the spring.

SP-2 SIDE CAMP

A flag stone quarry from which excellent flag stones have already been uncovered, was discovered by enrollees of SP-2 Side camp recently. The quarry is located on the Cartecay River, one mile east of Ellijay, Georgia.

The stones that have been taken from the quarry were from five to thirty feet square, and varying from one to two inches thick. They split easily and were of such a grade that they may be used for building purposes, and terrace work.

MUNICIPAL WATER SUPPLIES IN GEORGIA

By

W. H. WEIR, Assistant Chief,
Division of Sanitary Engineering, State Board of Health

The production of water for municipal and industrial consumption is one of the major utilities of Georgia. Approximately one hundred million gallons of water must be secured, purified, stored and delivered every day to supply the demands of the 325 cities and towns having public water systems. This essential material is delivered in the consumer's homes at any time of the day or night at a cost of less than ten cents per ton. Every gallon of water delivered must be safe to drink and also satisfactory for manufacturing purposes. To accomplish this requires unceasing vigilance to protect the safety and the uninterrupted service of the supply.

The water supply of a city or town must keep ahead of population increases and industrial expansion. This requires long range financial and engineering planning on the part of each municipality. It also requires the careful planning for the entire State because no city or town lives within itself in the matter of water supply. The same surface streams and underground waters are used by many towns. Thus every water supply is directly related and influenced by others. Very little thought or action has been taken by the State as a whole in planning and properly utilizing its water resources for the future. If Georgia is to keep pace with other states in population increase and in acquiring new industries it must abandon the present haphazard course and adopt rational methods to prevent the penalizing handicap of insufficient and unsatisfactory water supply.

The problem is somewhat different in the various sections of the State. The northern half of the State is largely underlain by dense crystalline rocks having practically the same physical characteristics as Stone Mountain granite. These rocks are not in themselves water bearing, but contain water only in the fissures and joints that intersect them. If a deep well happens to strike enough of these fissures and joints it may yield enough water to supply a small town. Such wells, however, often decline rapidly in yield, forcing the town to drill other wells or seek a supply of surface water. Many wells that have been drilled in this area have yielded an insufficient supply or have actually been dry holes. Costly experience has taught us that municipalities in the Piedmont and Mountain sections of Georgia cannot depend on an underground supply of water but must take their supply from a surface stream. Some cities, such as Griffin, have learned this and have already turned to a surface supply with modern plants for filtering and purifying the water. Other cities will in the next few years be forced to abandon their dwindling underground wa-

ter supply and turn to surface streams.

Many areas in the southern half or the State are underlain by sedimentary beds that yield large quantities of water, although the water is often hard and must be softened before it can be used as a municipal supply. Even in these areas the supply of underground water is by no means as inexhaustible as popular opinion would have it. Continued draft in certain localities has shown that underground water supply can be depleted and that surface streams in south Georgia will eventually replace many existing deep wells for municipal and industrial supply.

With this situation in mind, what is Georgia doing to obtain information as to the amount and quality of water flowing in her surface streams? The answer is nothing. Georgia alone of all Southern states provides nothing for gaging the flow of her streams or analyzing the quality of the water. The inevitable result of this unavailable essential information has caused the worthless expenditure of municipal money in paying to develop a water supply where the water does not exist in sufficient quantities. Further waste can be prevented only by making appropriations for stream gaging and continuing them over a long period of years. Any appropriation that Georgia makes for this purpose will be matched by an equal amount of Federal money and the work done by the trained engineers of the Water Supply Division of the United States Geological Survey.

The Division of Geology of the Georgia Department of Forestry and Geological Development and the Sanitary Engineering Division of the Georgia Department of Public Health stand ready to cooperate with Georgia cities and towns that desire a public water supply. The Division of Geology will advise the city or towns as to their best source, underground or surface streams, of a reliable supply of water. The Sanitary Engineering Division of the Georgia Department of Public Health will advise the city or town authorities as to the best means of assuring the purity of this water supply, will examine and approve the detailed plans made by the consulting engineer that the city employs, will train the personnel that are to operate the plant when it is constructed, will make bacterial analyses of the water delivered by the plant, and will keep a close check on the operation of the plant through the years to insure that the city is receiving a pure and healthful supply of water.

The accompanying water supply map prepared by the Sanitary Engineering Division of the Georgia Department of Public Health shows the distribution of public water supplies in Georgia classified as to

type of source, and treatment and purification. A review of this map will show the influence of the underground geology on municipal and industrial water supplies and the degree to which municipalities are now using the surface streams after deep ground sources have been exhausted. This trend from deep wells to surface streams will necessarily increase with population and industrial growth. An inventory of the stream resources of the State will provide a proper basis for investing public funds to accommodate present and future citizens with adequate and safe water supplies.

New Map Of Warm Springs Quadrangle Issued By U. S. Geological Survey

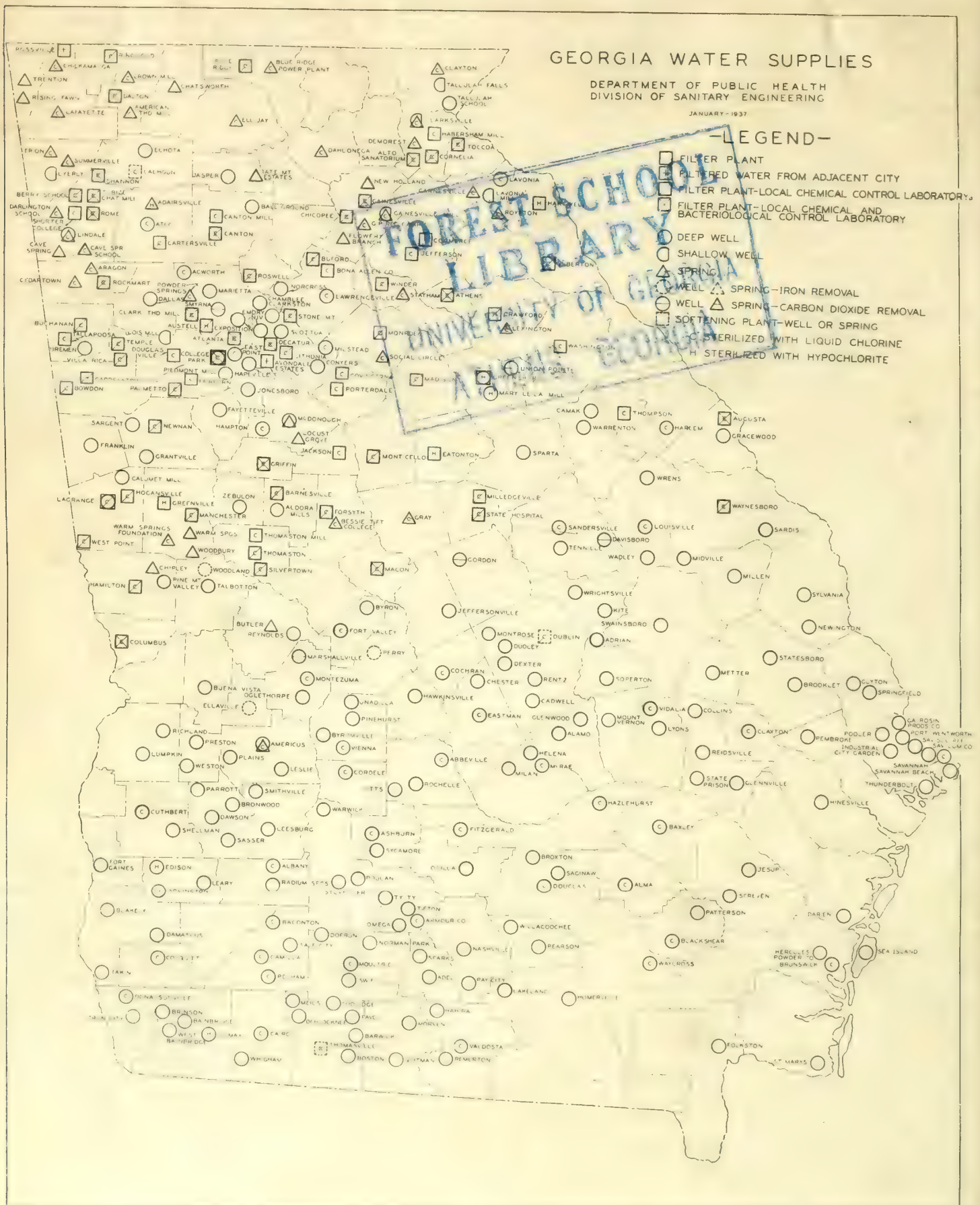
In 1933 the U. S. Geological Survey, in cooperation with the Georgia Division of Geology, undertook a comprehensive study of the Warm Springs district with particular reference to the warm springs of the area. The first part of this study, the preparation of a topographic map of the Warm Springs quadrangle, is now completed, and the new map will be available for distribution within a few weeks.

The Warm Springs quadrangle is situated in west-central Georgia between parallels 32° 45' and 33° 00' north latitude, and meridians 84° 30' and 84° 45' west longitude. It includes parts of Pike, Upson, Meriwether, and Talbot Counties. The scale of the map is 1:62500 or approximately an inch to a mile. The contour interval is 20 feet. The largest towns of the district are Manchester, Warm Springs, Woodbury, and Woodland. Warm Springs is 72 miles south of Atlanta and 40 miles northeast of Columbus. The area is crossed by three railroads, Central of Georgia, Southern, and Atlantic, Birmingham and Coast.

The quadrangle embraces an upland area, called the Greenville plateau, which is surmounted by two prominent ridges, Pine and Oak mountains. The altitude of the plateau ranges from 740 to 980 feet above sea level. The highest point in the district is Dowdell Knob, on Pine Mountain southwest of Warm Springs, which is 1395 feet above sea level; and the lowest point is the bed of Lazer Creek, in the southeast corner of the quadrangle, which is only 500 feet above sea level.

The largest stream crossing the district is Flint River which crosses the sinuous ridges of Pine and Oak Mountains in a tortuous gorge. Tributaries of Flint River drain approximately five-sixths of the surface area; tributaries of Chattahoochee River drain the western margin of the district.

The position of three warm springs and several cold springs are shown on the new map. The largest of the warm springs is at the town of Warm Springs where the naturally warm water is used in the treatment of poliomyelites. The geology of the springs is to be fully described in a bulletin of the U. S. Geological Survey to be published later in the year.



Map of Georgia showing distribution of water supplies mentioned on previous page by W. H. Weir, Assistant Chief, Division of Sanitary Engineering, State Board of Health.

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DEPARTMENT OF FORESTRY AND
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No. 3

The Southern Pine Attracting Much Attention Recently

**Due Largely To The Discovery That A Fine Grade
Of Newsprint Paper And Other Products
Can Be Made From It**

With Georgia entering the paper and pulp industry, the southern pines are destined to become an important cash crop. The South has for a short time been the source of wood for craft paper. With the discovery of Dr. Chas. Herty recently, that the "fat" in the pines can be removed, thereby making it possible to make the finest grade of Bond paper, within a very few years the paper industry in Georgia will be one of the largest sources of revenue.

The paper industry, which has been for the past number of years located in the North, is gradually looking to the South as the source of wood supply for the manufacture of paper. Several mills have already located in the South.

The first unit of the Union Bag and Paper Mill at Savannah is already working at full capacity, turning out 190 tons of high-grade paper a day. A second unit, now under construction, will double its production. This mill has a daily production of more than 12,000,000 bags, using in this production more than 200 cords of wood.

At Brunswick, the Brunswick Pulp and Paper Company is building a \$3,500,000 plant that will have a capacity of 400 tons per day. With these two mills soon to be operating in Georgia, a new source of revenue will bring into Georgia several thousand dollars annually.

It has been the policy of some of the paper mills in the South, up until a few years ago, to cut all of the timber from the land at one cutting. After noticing that the supply of wood within a reasonable area of their mills was being exhausted, they realized that unless they changed their practice of cutting all of the timber at one cutting it would not be long before they would have to purchase their supply of wood from a distance from their mills, which would greatly add to the cost of production of the paper and pulp.

It is interesting to notice that some of

the mills that are coming to the South, after seeing the mistake other mills have made in this regard, are beginning to work with the timber owners and encourage them to follow a definite policy regarding cutting their timber for paper and pulp and treat their forest as a "farm crop", rather than cut all of their timber at one time. The timber owners are encouraged to sign pledges, calling for fire protection and sustained yield management. The mills through their trained foresters will assist the timber owners in carrying out this policy.

If the timber owners will cooperate with the mill owners in treating their forests as a "farm crop", they will be able to sell part of their timber for pulp wood, turpentine the larger trees and market the trees that have been turpented for a long period of time for lumber. Unless they do manage their forests on this system, it will not be many years before the entire supply of wood will be exhausted.

The main reason the paper industry is coming to the South is because, through the efforts of Dr. Chas. H. Herty, it has been definitely proven that the paper from the southern pines is as good quality, or better than that made from the northern spruce pines and can be made much cheaper. According to Dr. Herty, newsprint of the quality that would cost \$47.48 per ton to produce in the North can be produced in the South for \$27.50. Pulp for making rayon, costing \$70 plus freight charges to the South, can be produced from southern pines for \$35.

To meet the argument of the paper makers of the North, that the pulp made from southern pines will not be of good enough quality to make paper in the larger mills, Dr. Herty sent three tons of pulp made from southern pines to paper machines in Canada. The paper made from this pulp, made on these machines, was of a quality equal to any in the entire country. Several large daily newspapers of Georgia printed

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GEORGIA FORESTRY ASSOCIATION PRIZE WON BY STUDENT AT DAWNVILLE

TELLS OF IMPORTANCE OF PROTECTION AND REFORESTATION

Harold Carson, student in the Dawnville Consolidated School, Whitfield County, is the winner of the second award of \$5.00 offered by the Georgia Forestry Association for writing the best article pertaining to his school program.

In discussing the future of forestry in Georgia, Harold stresses the importance of preventing forest fires and of reforesting the idle and worn-out lands. He also states that in 1932 a number of slash pine seedlings were planted in his community and that today these seedlings measure more than four inches D. B. H.

Looking Toward the Future of Forestry In Georgia

By
HAROLD CARSON

The practice of preserving our forests in Georgia is just in its infancy. We are not yet educated to the value of our forests. We do not take care to protect our forests from fires and many million acres are destroyed each year as a result. Fire not only harms the large trees but destroys our future trees. Fire destroys the forest floor. This cover of needles and twigs acts as a sponge in taking up the rain. It checks soil erosion. We have an outstanding example of what will happen if too many of our forest floors are destroyed. One of the greatest floods in the history of the United States occurred recently in the Ohio Valley. As a result, a tremendous number of lives were lost and property damage costs were estimated above a half billion dollars. Many millions of dollars are being spent to hold these flood waters by building levees but it is of more importance that forests should be planted that they may absorb these flood waters. Therefore, it is important that we protect

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Any information appearing in this publication may be used at any time provided proper credit is given.—The Editor.

BULLETIN ON SOIL DEFENSE

Presenting for the first time a comprehensive discussion of modern conservation farming methods, which have proved practical in preventing soil erosion throughout the Piedmont section of five southeastern states, the Department of Agriculture has issued a new farmers' bulletin, "Soil Defense in the Piedmont", by E. M. Rowalt, of the Soil Conservation Service. This bulletin, 1767, may be obtained from the Superintendent of Documents, Washington, D. C., for 15 cents a copy.

TREE FIGURES

Forestry authorities state that a tree with a 26-inch trunk contains about 19 times as much lumber as a 9-inch tree, and that it is estimated that the uppers in the larger tree increase its average value per foot, almost doubling its gross returns as compared with the smaller tree. In other words, the quantity ratio is 19 to 1, but the gross value ration is 36 to 1.

This estimate is, of course, based on comparison of sound, normal trees.

STATE PARK NEWS

C. C. C. CAMPS

SP-13

On February 2, the clear cold sparkling waters of mountain brook were impounded as the locks to the gates were sealed, thus marking the beginning of the lake, it is estimated that three months will be required to send the waters over the spill-way, when full the area will embrace approximately 17 acres.

This should prove a popular resort when it is opened to the public as the water is very invigorating especially on a hot dusty summer day. A beach of white sand has been laid out and chained off from the deep water for the enjoyment of the kiddies, it is in the shallow end of the lake and near several large shady trees, making an ideal playground for the youngsters.

The lake has a picturesque situation, Pine Mountain towering in the background and the picnic shelter and grounds nestle at its foot, while on the slope above the rustic cabins with chimneys of native stone cluster among the pines that spread protecting branches above them, they form a charming group with the native shrubs and flowering plants as a setting. It will indeed be a welcome refuge from the hot blasts of summer.

The number of acres burned as well as the number of fires in this area has been materially reduced during this fire season. This may be attributed to the fact that the fires are generally discovered and men dispatched to control them before they can gain any headway, also due to the Park work not being confined to a small area it is easy to detect any unusual smoke in the neighborhood without waiting for the fire to be reported, or having fire scouts on patrol.

On the crest of Pine Mountain near Tip Top, the highest point, the Park entrance has been constructed. It is artistically laid out and at strategic points native plants have been moved and transplanted to add to the attractiveness of the surroundings. These planting areas are protected by a curbing of native stones, a commodious parking "overlook" has been arranged which affords a convenient place to pause and view the valley below. This panorama is an extensive and interesting one and is well worth anyones time to visit.

The Scenic Highway which continues from the entrance on to Warm Springs, through the Park, is being enhanced at various points by the planting of indigenous plants, to supplement the existing growth and add to the pleasure of the visitor who may drive through this naturally beautiful and interesting section of the State.

VOCATIONAL STUDENT'S ARTICLE

(Continued from Page 1)

our forests and enter into a program of replacing the forests we have used.

In this program there are two main divisions. First, is protecting our forest from fires. Second, is the program of reforestation.

Fire most commonly destroys our forest trees. If fire does not completely kill the tree, it has other effects. It destroys the forest floor which is so valuable to successful tree growth and in preventing soil erosion. Fire destroys tree seed and young tree seedlings. From practical demonstration on the school forestry tract we have noted the difference between a burned and an unburned tract of forest land. Several years ago the agricultural class burned off a small tract of forest under fire control and each year has noted the effects upon the burned tract in comparison with the unburned tract. We noted from this demonstration that the pines in the burned tract are growing large at the base, are becoming affected with disease and that the tree growth has almost stopped. There are large scars on the trees and rosin is appearing on these scars, thus making the trees more subject to fire a second time. We found that there are no small trees growing because fire destroyed the seed as well as the young seedlings. On the unburned forest tract we found that the trees are of uniform shape and size, are making a steady growth and are free from scars and diseases.

After noting the disastrous effects of fire upon our forest we should realize the value of protecting our forests from fires. First, we should take care not to spread fire when burning brush piles, or burning off ditch banks, or any other way in which we are apt to spread fire. Second, we should establish firebreaks to protect our forests from fires that have already been spread.

Not only should we protect the forests we are growing but we should reforest much of our land. Most farmers in North Georgia today are farming worn-out hillsides from which they receive little profit. These lands should be reforested before they wash out into deep gullies. Not only does reforestation play an important part in protecting our soil but it is a worthwhile industry to be undertaken.

Just to prove that reforestation is a worthwhile enterprise for North Georgia, there is a nice project of slash and loblolly pines about one mile from the school. These pines were set out in 1932 by the Dawnville Vocational Class. Today the slash pines will measure four inches D. B. H. Although the slash pine is not a native of North Georgia, this project proves that slash pines will grow in this section.

The Southern Pine Attracting Much Attention Recently

(Continued from Page 1)

ne edition of this paper. The editors have all been of the same opinion and have said that this paper was not only of a quality equal to any in the country but was better than most of what they were using, which comes from the North and part imported.

Along with the development of the paper and pulp industry in the South from the southern pine, another industry is being developed using the needles from these pines. In Hattiesburg, Mississippi, a product known as "pine felt" is being developed. This felt is to be used for upholstering, for mattress filling and similar purposes.

Pine needles brought to the plant by farmers who collect them bring an average of \$4.00 per ton. It takes two tons to make one ton of fiber. The needles are placed in a retort and chemically treated, then run through a series of carding machines which tear them into fine threads. After being thoroughly washed, dried, and baled, they are ready for market.

The question is often asked—Why is the slash pine so well suited for the manufacture of paper? The answer is—It will grow at a much more rapid rate than most of the other pines. This species will often grow to a diameter of more than twelve inches in twenty to twenty-five years. In the North it would require more than fifty years to produce a tree of twelve inches. This fact, along with the fact that the Southeast is well suited to grow these trees, is the main reason why pulp can be produced at approximately one-half the cost in the South of that in the North.

The slash pine is, however, not the only species growing in Georgia that can be used in the manufacture of paper and pulp. Trees of any species of pine, of the same diameter, will produce the same amount of pulp, and of the same quality as that from the slash pine. The slash will attain a larger diameter in less time than any of the others. The loblolly is the next fastest growing pine, and in some instances, under favorable conditions, will grow as fast as the slash.

It is very interesting to follow one of the logs through the paper mill. We are giving a brief account of the different treatments received in the paper and Pulp Laboratory, in which Dr. Herty has conducted all of his experiments.

"The pine wood comes in like the logs to be seen in almost any cord of wood. They come cut in lengths of about eight feet and measure from four to eight inches in diameter. Mills can, however, take larger sticks—in fact as large as they develop before 'the heart' comes, that is up to 12 inches in diameter.

"The first step is to remove the bark from the logs, after which the sticks are

cleaned and taken to the 'chipper' where they are cut into chips about $\frac{3}{8}$ inches long.

"The process we are describing is that used to manufacture paper of a good grade. That of a coarser grade is made in a little different process.

"From the chipper the chips are taken to a large boilerlike tank called the 'digester'. Into this they are dumped, after which cooking liquor consisting of bisulphite of lime and free sulphurous acid is added. Steam is introduced directly into the bottom of the digester, resulting in a general raising of the temperature until about ten hours later it approximates 300 degrees Fahrenheit. Then, by use of not only chemical tests and observance of the color of the liquor but by the operator's experience in 'cooking' it may be known whether or not digestion is complete. The chips still have the same form as before being cooked, but in the meantime certain cementing or holding materials between the fibres have been dissolved in the cooking acid.

"Short fibre pulp is needed for smooth surface printing paper such as this. As pine is all 'long fibre', gum logs or other hard woods are used to provide 'short fibre' pulps, these furnishing fibre only one quarter as long as the pine. No gum is used in making newsprint paper, this being all long fibre pine.

"From the digester the cooked chips and the liquor are blown into a closed tank, provided with a perforated tile bottom through which the dissolved wood substance and waste liquor are drained off. From here the drained and washed pulp goes over vibrating screens which remove knots and any portions of the wood which have resisted cooking. And as a result we come through the first process with unbleached sulphite pulp of either gum or pine, whichever grade of wood has been used. And after bleaching, the pulp is in appearance much like short fibre bleached cotton, and is practically pure cellulose.

"In a machine known as a beater, the bleached pine and the bleached gum sulphite pulps are mixed, and to the mixture is added Georgia white clay."

An interesting experiment conducted recently by Elliott W. Reed, a prominent timber owner in Chatham County, from which he figured a possible income per acre per year, revealing that using 73.5 acres of slash pine and conducting it as a "farm crop", which would include Pulpwood, Naval Stores and Saw Timber, that over a period of twenty-six years a net profit of \$4.60 per acre per year could be realized.

The Southern Pine is also important from a Naval Stores standpoint. In 1933, there were 449 Naval Stores Operators in Georgia, paying in wages \$2,684,000 to more than 13,000 persons. During that same year, the value of turpentine and rosin was \$8,617,000, which was increased by manufacturing by \$5,178.00.

The Southern Pine also plays an import-

ant part in soil erosion and flood control. According to official records of the U. S. Forest Service on the continuous flow of streams from 23 small watersheds, representing different types of forests and other vegetative cover conditions, for periods of from one to two and a half years, it was found that for a twelve months' period the average maximum water flow for all forested watersheds amounted to only 38 cubic feet per second per square mile. In no case did the water run-off from forested watersheds assume critical conditions, whereas from the non-forested watersheds numerous instances were recorded in which the maximum flow assumed very serious flood proportions. Due to the rapidity of growth of the pine, it is the species that is being used in larger quantities today than any other species.

Realizing the importance of the southern pine in the economic development of the South today, the Division of Forestry, of the Department of Forestry and Geological Development, has established two nurseries in which pine seedlings are raised and sold to timber owners of the State at the cost of production. These nurseries are located at Albany, Georgia, and Blairsville, Georgia. To show the increase in the amount of seedlings sold the first year these nurseries were operated and the past year, there were around 700,000 seedlings sold the first year and this year there will be more than 5,000,000 sold. The price of these seedlings per thousand is \$2.00 for the pines and \$3.00 for the black locust. The supply of seedlings in both nurseries is exhausted.

The seedlings are sold at the age of one year. They are taken from the nurseries at this age and sent to the buyers when it is recommended that they should be planted. At this age, the seedlings are from ten to fifteen inches in height. If planted at the proper time and in the proper manner, and nothing serious happens to them, there is no reason why one should not expect a large number of them to survive. Recommendations as to the time and method of planting can be secured from the Division of Forestry by writing to the State Forester.

Approximate Number of Seed Per Pound Borne by the Various Trees Listed Below

Shortleaf Pine	45,000
Loblolly Pine	18,000 to 20,000
Sumac—	
Fragrant Variety	46,466
Smoked Variety	7,488
Redbud	12,096
Dogwood	1,792
White Oak	208
Post Oak	480
Spanish Oak	408
Black Walnut	30
Black Haw	1,280

INTERESTING FACTS AND VALUABLE INFORMATION REGARDING NEWSPRINT MANUFACTURE GIVEN BY DR. HERTY

DETAILS OF DEVELOPMENT OF FINEST GRADE PAPER FROM PINES OF MUCH INTEREST TO SOUTHERN TIMBEROWNERS

Speaking on the Atlanta Journal Editorial Hour, broadcast from radio station WSB, Friday evening, September 11, 1936, Dr. Chas. H. Herty, gave assurance of a great industry for the south being developed within the near future in the manufacture of the finest grade of newsprint from the southern pine. Potentialities of the paper industry as a whole were discussed, and Dr. Herty, very optimistically, stated that he believed that manufacture of newsprint would be the next great industry to concentrate in the Southeastern section of the United States.

Dr. Herty was interviewed by Wright Bryan, City Editor of the Atlanta Journal. Complete text of the interview follows:

Q. Dr. Herty, you are a scientific observer of industrial growth and industrial trends, what do you think will be the next great industry to develop in the Southeast.

A. The manufacture of newsprint, the paper on which 37,000,000 newspapers are printed every day in the United States. It has been demonstrated in our laboratory that southern pine not only makes good newsprint, but it makes better newsprint than any on the market today. It has been further demonstrated that this newsprint can be manufactured in this section far more cheaply than anywhere else in the world and that we have abundant raw material here for another great industry in addition to the manufacture of kraft paper, which is now almost wholly a southern industry.

Q. How do you know that newsprint from southern pines compares so favorably in quality with paper made in other sections and other countries?

A. Comparative tests of ordinary commercial newsprint submitted to us by The Atlanta Journal, the New York Times and other newspapers, show that these papers were excelled in all the tests applicable to newsprint — bursting strength, tensile strength, tearing strength, stiffness and porosity—by newsprint manufactured in our own laboratory in Savannah. Comparative printing tests, under actual newspaper publishing conditions, show better results.

Q. What was the most serious obstacle which you overcame in proving that newsprint could be manufactured from pines not only under laboratory conditions, but on a commercial scale?

A. It was the justifiable criticism of our opponents that newsprint made in our laboratory was run through machines at

the rate of only 100 feet a minute, whereas commercial machines run 800 to 1,200 feet a minute. We did not have the means or the space to put in a fast commercial machine, so we took our pine pulp made in the laboratory to a friendly mill in Canada, where it was run through fast commercial machines for eight and one-half hours without a break. With the carload of paper we brought back, nine Georgia dailies, including the Atlanta Journal, published their regular issues with first-class printing and complete success. Since then our efforts have been directed toward producing an even better quality pulp. As a result, the quality of our paper has greatly improved.

Q. Is the quantity of pine in the South sufficient to insure raw materials should the industry move here?

A. There is in the south today more than enough pine, not needed for other purposes, to supply the needs of the entire world, and a rate of reproduction of pine trees sufficient to continue that supply in perpetuity, thus assuring adequate raw material to be raised on land not needed for other purposes.

For power and steam we have an abundance of cheap fuel in the form of fuel oil, coal and hydroelectric power.

The very chemicals needed in paper manufacture are produced in the South.

And finally, as to labor, it will be necessary, of course, to draw in certain technically trained help from other sections. But I know from evidence in my own office that such technicians are anxious to come south. More than this our southern young men have already demonstrated that they quickly adapt themselves to this line of manufacture. The relief rolls of the south can be largely eliminated by the demand for common labor required in constructing and operating the mills. Thousands of people will find employment cutting wood and hauling it to the highways or railroads. The permanent solution of unemployment is in the development of new industries. What we need is to give employment to common labor. There is already a scarcity of skilled labor. I don't know any better way for common labor to be employed than out-of-doors, in the woods, in the healthy work of cutting, sawing and hauling pulp wood.

The great pouring out of money for pay-rolls and the income which farmers will derive from the sale of timber will find its way into retail trade. This in turn will stimulate wholesale trade, and this activity

means every bank in the south would prosper.

To sum it all up: Raw material worth \$4 at the mill can be converted into a ton of finished product selling today at \$41, and selling on contracts for delivery next year at \$42.50, with every indication of still higher prices by the time mills could be constructed in the south.

Q. How does the cost of manufacturing this paper in the South compare with costs prevailing elsewhere?

A. In 1933 the official record of hearings before the paper code authority showed costs of over \$47 a ton at mills in the northern states, operating then at only 50 per cent of capacity.

With better times, the mills are now operating at full capacity, so that I imagine they can deliver newsprint in New York at a cost of about \$41 a ton, but this is without any return whatever on the capital investment. Newsprint can be manufactured in the south under the same conditions and put in New York from any southern port for \$27.54 a ton by our estimates, and these estimates are questioned by no one. As a matter of fact, I know our estimates are somewhat high. We figured wood should bring \$4 a standard cord, whereas, this wood may be bought today in enormous quantities for \$3.50.

At the meeting of the Society of American Foresters held in Atlanta a few months ago, with the opponents of southern newsprint development conspicuously on the program, there was not one criticism of the quality of newsprint made from southern pines, or of our estimates of cost.

Q. What has been done toward bringing the newsprint industry to the South?

A. I have tried in every way possible to give the fullest publicity to the findings of our laboratory. This led to the Southern Newspaper Publishers Association forming a committee on the development of a newsprint industry in the south. That committee came to Savannah and saw the actual manufacture of newsprint. The committeemen became so enthusiastic that they obtained from members of their association sufficient contracts to insure for five years the sale of every ton of paper a 200-ton per day southern newsprint mill could manufacture. That committee has in its possession the signed contracts and the authority of the association to place these contracts with any reliable group of capitalists who will develop such a mill, regardless of what state in the south might be its site.

This action by the Southern Newspaper Publishers' Association is extremely important, for it means that the first newsprint mill in the south could not be affected by any cutthroat competition or other efforts to destroy it in its infancy.

(To be continued next month)

FIRST DISTRICT

**T P. Hursey, Dist. Forester,
ROME**

During the past month, the District Forester has continued the educational program that was begun the first of the year. The bad weather has been much of a handicap, nevertheless approximately 5,000 people have been contacted with the motion picture machine to date.

The Cherokee T. P. O. is expanding slowly but constantly. However, a great expansion is not expected until the beginning of the next fire season.

In visiting the vocational schools, a great deal of time has been spent with the students in teaching them how to cruise timber. Of the number that have been taught, approximately 100 students have learned how to cruise timber, to the extent that they can do a fairly accurate cruise and be able to estimate the amount of timber on any given area.

FOURTH DISTRICT

**R. R. Evans, Dist. Forester,
Columbus**

Increased interest in reforestation is being manifested throughout District 4. A large number of seedlings have already been planted during the present planting season.

In some cases those wishing to plant seedlings have been unable to secure them on account of the State nurseries not being able to supply the seedlings. As a guard against this in the future, a number of timber owners have already placed their order for seedlings with the State Forester to be shipped next season.

An unusually large order has been placed with the State Forester in the amount of 600,000 seedlings by Mr. Fuller E. Callaway, Jr. of LaGrange. Mr. Callaway has ordered slash pine, longleaf pine and black locust. These seedlings are to be used by Mr. Callaway on eroded land, in order to check the enormous amount of soil lost annually by soil erosion. We are reliably informed that this is the largest number of seedlings ordered by any one person to be shipped during the next planting season.

We would like to advise others in our district, who are especially interested in reforesting their idle and worn out lands, to place their order as early as possible with the State Forester for the amount they would like to have. This will insure their getting the seedlings, which otherwise if they wait until late next season they would probably not be able to secure them at all.

FIFTH DISTRICT

**Herbert C. Carruth, District
Forester, Macon**

During the past month the District Forester has supervised and assisted in the planting of more than 85,000 slash pine seedlings. Of this number, 25,000 seedlings were planted on the Dykes Farm in Macon County. This is the beginning of a planting program on this Farm, which, when completed, will be extended over a period of ten years and more than 1,000,000 seedlings being planted. A large number of seedlings also have been planted in District 5 other than under the supervision of the District Forester.

There is only one active T. P. O. in this District but plans are in effect to organize, or revive, what was formerly known as the Crisp County T. P. O. Mr. H. G. Wiley, County Agent, Crisp County, is very much interested in reviving this T. P. O. and is assisting the District Forester materially. The organization, when it is organized, will include parts of Crisp, Dooly and Wilcox Counties.

Mr. Robert C. Berckmans, one of the oldest nurserymen in the State and a resident of Macon, is planting 600 pounds of slash pine seed on the coast near Brunswick, Georgia. This is an unusually large amount of seed to be planted by one individual. During the past six years Mr. Berckmans has made numerous plantings in the vicinity of Macon and has kept accurate records on the mortality of the seedlings.

SIXTH DISTRICT

**W. G. Wallace, Dist. Forester,
Savannah**

FIRE-FIGHTING EQUIPMENT PURCHASED RECENTLY

Individual landowners and T. P. O.'s have recently purchased various fire-fighting equipment, among the most interesting of which are two new Chevrolet trucks on which are mounted the special Panama Fire Pump, water storage tanks, hose, and several of the Indian Fire Pumps and other equipment. James A. Fowler of Soperton is the owner of one of these, and the Canoochee River T. P. O. at Swainsboro has the other.

Several individuals have recently purchased fire pumps of the hand operated type, and T. P. O.'s have acquired fire-fighting tools. The Liberty-Long T. P. O. has a new disc harrow plow for maintenance. A. H. Croom, of Pembroke, has a new tractor and plow for fire line construction, and is otherwise taking an immense and active interest in managing his forest land.

EMANUEL COUNTY INITIATES COUNTY-WIDE FIRE PROTECTION

That the citizens of Emanuel County intend to protect their timber land is very evident if one will review the progress of the Canoochee River T. P. O. Through the active cooperation of Emanuel County, the Canoochee River T. P. O. now has a new Chevrolet fire truck mounted with a Panama Fire Pump, 300 gallon water storage tank, and twenty-four Indian Fire Pumps. This outfit is stationed at the County camp which is connected by phone with the extensive telephone line system established by the C. C. C. Five men are always available for immediate call, and the truck will be sent anywhere in the County on call.

In addition to the above feature, the T. P. O. has carried four full page ads in consecutive issues of the county paper, The Forest Blade, and this paper has been sent to **EVERY** rural mail box in the County, amounting to approximately five thousand. It goes without saying that much favorable publicity has been given this work through editorials and news items in papers throughout this section of the State.

Graham Coleman, Manager of the Canoochee River T. P. O. announces that the T. P. O. has had four towers manned with trained lookouts since December 1st. It is also possible that Emanuel County will soon have three County Patrolmen employed, whose principal duty will be to patrol the county and keep on the lookout for forest fires, also to assist in the apprehension of persons willfully destroying our forests contrary to State Law. Great credit must be given the County Board of Commissioners of which Mr. Virgin Durden is chairman for the progress being made in Emanuel County in better forest practices and efficient forest fire protection available to every forest acre in the county.

TWIG KEY TO TREES OUT

"Twig Key to Some Common Northeastern Trees," by W. M. Harlow, N. Y. State College of Forestry, Syracuse, has just been published. It is a non-technical key for Boy Scouts, Girl Scouts, 4-H Clubs, the CCC, and is especially useful in winter.

TO BREED TREES

The Northeastern Forest Experiment Station, New Haven, Conn., is starting a project in forest tree breeding directed toward the development of improved trees for reforestation purposes. The announcement was made by Dr. Ernest J. Schreiner, associate conservationist at the station to the Plant Science Club at Yale University. Dr. Schreiner said that new forest types will be developed through hybridization and breeding along the same lines as in agricultural and horticultural plants.



SEVENTH DISTRICT

Russell Franklin, Dist. Forester
Waycross

T. P. O.'s General

The Directors of the Coffee-Jeff Davis T. P. O. recently appeared before the County Commissioners of Coffee County and obtained a pledge of \$1,500.00 for the T. P. O. for the year 1937. This is just another step toward county-wide fire protection in all of the counties in this District, as this is the sixth county to cooperate with their T. P. O. in fire protection, although in most cases the counties do not subscribe enough to put the county on a strictly county-wide basis.

Glynn County has the most complete county-wide plan of any county in this District and it is rumored around that they will soon have a radio system that will be used jointly by the county and the T. P. O. in directing fire suppression activities as well as the activities of the County Police. The thinning and planting projects undertaken by the ECW forces have created quite a bit of interest in this section. A number of additional requests for these projects by the landowners have been received. It is too late, however, to undertake any more of these projects this year and those not getting them will have to look at the projects in their area in such a way that they will realize that the educational value of these projects to the community at large offsets any value to them as an individual.

We have a wonderful opportunity in the thinning projects to record the increase in the growth of the thinned stands over the stands not thinned, and in the case of the planting projects there is a wonderful opportunity to note the difference in growth of seedlings on various sites and also the difference in growth of nursery grown seedlings and those taken from the woods.

FOREST

C. C. C. CAMP NEWS

P-62

Going beneath a river to make fire fighting more efficient is something new, and it's being done by Co. 1424, Baxley, Ga. Men of that camp are laying submarine cable under the Altamaha River to connect forest service telephones with towns on the other side and towers in the district. This will enable the towers to obtain cross readings on fires in counties adjoining the river.

The enrollees of Co. 1424, who work

at the Central Repair Shop, have recently helped rebuild two trucks which were sent to Jacksonville, Florida. Here they were loaded on a boat and are to be delivered to the CCC in Puerto Rico.

P-92

The educational program of Camp P-92 has recently been organized and very good attendance of classes is now reported. Three to five classes are held each night and a good variety of subjects are being taught.

Work on firebreak and truck trail projects has been progressing smoothly until recently. Rains have made "fill hauling" rather bad and some difficulty has been had in getting loaded trucks through the woods to and from projects.

Unusually warm winter weather has taken a sick toll on the activities of the camp. Flu and colds have put an average of ten to fifteen in quarters for the last month.

Fires in the Altamaha-Satilla T. P. O. have been few up to the present time. On the 126,231 acres in the T. P. O. in Glynn County only two fires have necessitated calling out C. C. C. men. Only 15 man-days were used and the acreage burned totaled only 300 acres.

In Brantley County all fires have been easily handled by the "T. P. O. fighters" and to date it has not been necessary for C. C. C. enrollees to give assistance.

This record is much better than that of the season of 1936 and shows a very definite trend toward eliminating all forest fires.

T. P. O.

NEWS

Appling County T. P. O.

More than 100,000 slash pine seedlings have been planted in Appling County during the present season, due to interest created through the T. P. O. organization.

A 10-acre demonstration project has just been planted by CCC enrollees on the Riddle Brothers property. The seedlings used on this project were not nursery seedlings but were taken from the area near the demonstration plot. Nearly 100% of these seedlings have lived and it looks as if they are going to continue to live. Another project of this nature has also been started on the property of B. K. Whitehead.

County Agent, L. C. Walker and the T. P. O. Secretary are planning a number of thinning demonstrations at each of the large schools in the county. These thinning demonstrations will be conducted on 4-H Club forestry boys property. Extension Forester, DePre Barrett is cooperating in this project by being present at these demonstrations and showing motion pic-

tures as to the better practices of forestry.

At a special meeting of the County Commissioners of Appling County the amount of \$300.00 was given to the T. P. O., which is to be used in maintaining lookout towers throughout the T. P. O. area.

Quite an increase in interest in the work of the T. P. O. organization has been manifested recently by old members paying their dues and a number of new members signing their land in the T. P. O. organization.

Not a single fire has occurred to date on the property under organized protection. A great reduction is also noted in the so-called "controlled burned", which is an indication that efforts along this line are having good results.

FUTURE ORDERS FOR SEEDLINGS INDICATE MANY TO BE PLANTED

ORDERS VARY FROM ONE TO SIX HUNDRED THOUSAND

If the number of orders received for future shipment of seedlings is any indication of the number that will be planted during the next season, it will mean that more will be planted than ever before.

Already orders that have been received by the State Forester total more than 1,103,000 seedlings. These orders vary from 1,000 in number to 600,000 in one instance. Several orders have been received for more than 25,000. Mr. Fuller E. Callaway, Jr., of LaGrange, Georgia, is the party who ordered 600,000 seedlings. So far this is the largest order received to date. He has asked that this order be filled with slash and longleaf pine and black locust. Mr. Elliott W. Reed, President of the Ogeechee T. P. O., of Savannah and Mr. Roy Rogers of Newton, Georgia, have each placed orders for 100,000 slash pine.

The Georgia Forest Service has never been able to supply enough seedlings to meet the demands for those asking for them. In an effort to more nearly supply the demand for seedlings during the next season, plans are in effect to increase the size and equipment in both of the State nurseries to the extent that approximately twice the number of seedlings grown this season may be grown during the coming season.

Anyone desiring seedlings during the next planting season are advised to place their order as far in advance as possible, as the orders are filled in the order they are received.

Wooden water pipes in Tacoma, Wash., laid more than sixty years ago when recently uncovered by city water department crews, were found to be in excellent condition.

THE MINERAL PRODUCTION OF GEORGIA FOR 1935

Reported by THE DIVISION OF GEOLOGY

Richard W. Smith

The value of the mineral production of Georgia for 1935 was \$9,984,313., an increase of about 22.4 per cent over that of 1934. If we add to this the value of electricity produced from hydro-electric plants we get a total of \$21,073,030. Georgia ranks first among the states in the value of its production of raw clay and fullers earth; second in the value of its production of marble, monumental granite, barite, and manganese and mangiferous iron ore; and third in the value of its production of bauxite.

Table I below is a summary of the tonnage and value of Georgia's mineral production for 1935, together with the percentages of increase or decrease over the 1934 figures. The statistics of which there are less than three producers in Georgia are confidential and cannot be revealed. These minerals are marked in the table with an asterisk (*) and their tonnages and values have been reported in combination with other such minerals so as to conceal individual figures.

The collection of the statistics of the mineral production of Georgia is undertaken by the United States Bureau of Mines and the United States Bureau of Census, with the cooperation of the Division of Geology of the Georgia Department of Forestry and Geological Development. The gathering of this information is a slow process, as many firms do not report their productions until considerable time has elapsed.

Barite: Barite is a heavy white mineral which, when ground, is used largely in the manufacture of lithapone for use in paint. It is also used in the manufacture of barium salts, in the refining of sugar, in glazing pottery and enameling iron, and as a filler in the manufacture of paper and rubber. All of the 1935 production came from the Cartersville district of Bartow county.

Bauxite: Bauxite, the oxide of aluminum, was first discovered in America in 1887 near Rome, in Floyd County, Georgia. Since that time it has been mined in Floyd, Bartow, and Polk counties in northwest Georgia and in Wilkinson, Macon, Randolph, Schley, and Sumter counties in middle Georgia. The production in 1935 all came from Sumter County and was largely used in the manufacture of alum salts for use as a water conditioner. A new bauxite mine in Bartow County started operations in 1936.

Cement: Portland cement was manufactured from limestone and either shale or

clay at two plants, one in Polk county and one in Houston county.

Clay (kaolin): Georgia produces over 65 per cent of the kaolin mined in the United States for use as a filling and coating clay in the manufacture of paper; as a filler in the manufacturer of rubber, oil cloth, and other products; and for use in the manufacture of china and other white ware. Its use in these products is largely replac-

duction for 1936 will be in the neighborhood of 400,000 tons.

Clay Products: The production of brick, sewer pipe, tile, and pottery from Georgia clays showed an increase in 1935 over that of 1934 of nearly 60 per cent. Common and face brick and structural tile are manufactured from the alluvial clays of middle Georgia. Sewer pipe, structural and roofing tile, and common and face brick are made from the shales of northwest Georgia. The production of these will probably continue to increase with the recovery of the building industry. Jugs, churns, and art pottery are made at some 18 small potteries scattered throughout middle and north Georgia.

Coal: Only one coal mine is reported in operation in Georgia; that of the Durham Land Company on Lookout Mountain in

TABLE I
THE MINERAL PRODUCTION OF GEORGIA FOR 1935

Material	1935 Tonnage	Change from 1934	1935 Value	Change from 1934
Clay (Kaolin):				
Paper and china clay, etc.	298,275	+ 26.1%	\$ 2,251,785	+ 46.6%
Refractory uses	41,502	- 13.4%	97,933	+ 13.6%
Marble	23,020	- 42.4%	950,430	- 3.9%
Granite	563,000	- 6.5%	1,122,029	- 6.1%
Clay Products			2,274,407	+ 59.5%
Bauxite*		+ 32.4%		+ 60.6%
Fullers Earth*		- 13.6%	1,819,511	- 2.5%
Portland Cement*		+ 1.5%		+ 19.6%
Limestone, Lime	617,782	+ 97.1%	618,786	+ 69.7%
Talc*		+ 20.0%		+ 33.2%
Slate*		+ 42.3%		+ 29.3%
Mica, Chlorite and Sericite Schist*	16,606	+ 50.1%	155,095	+ 51.0%
Tripoli:*		+900.1%		+244.0%
Sand and Gravel	364,507	+ 12.0%	240,565	+ 4.7%
Barite*		- 27.0%		- 33.7%
Ocher*	43,772	+ 47.0%	345,659	+ 45.5%
Manganese*		- 30.9%		- 11.7%
Coal*		- 39.7%		- 37.5%
Iron Ore*	23,183	+168.9%	77,685	+316.5%
Kyanite*		+ 25.0%		+ 66.6%
Gold and Silver:				
Gold:				
Placer	332.50 fine ozs. }			
Lode	661.28 fine ozs. }	2.5%	34,782†	+ 2.6%‡
Silver:				
Placer	10 fine ozs. }			
Lode	64 fine ozs. }	54.2%	53	+ 41.5%
Total			\$ 9,984,313	+ 22.4%
Water Power			11,084,310	+ 6.3%
Grand Total			\$21,073,030	+ 13.4%

* Less than three producers, so production and value cannot be shown separately.

† Valued at \$35.00 per ounce. Value at old price of gold (\$20.671835 per oz.) would be \$20,653.26.

‡ Percentage increase is shown with 1935 production valued at \$35.00 per ounce and 1934 production valued at \$34.95 per ounce.

ing the English clay formerly used. It is also used in the local manufacture of high-grade fire brick and other refractories. This sedimentary kaolin was mined in 1935 in the following counties, named in order of the value of production: Wilkinson, Twiggs, Washington, Richmond, Hancock, Glascock, Baldwin, Houston, and Taylor. The 1935 production of nearly 340,000 tons was the largest in history. yet preliminary estimates indicate that the pro-

Walker County.

Fullers Earth: Although Georgia is still the largest producer of fullers earth, a variety of bleaching clay used mainly in refining oils, the production in 1935 again showed a decline over that of the previous year. The production from Decatur and Thomas counties is used with mineral oils, whereas that mined in Twiggs and Wilkinson counties is used mainly with vegetable oils.

Deposits of a bentonitic type of bleaching clay which, when activated by acid treatment, are superior to fullers earth for leaching oils were discovered in South Georgia in 1935 and were briefly described in Information Circular No. 6 issued by the Georgia Division of Geology. Further investigation of these deposits should be made at once if Georgia is to continue to lead in the production of bleaching clays.

Gold and Silver: The production of gold in Georgia, which doubled in 1933 and again nearly doubled in 1934, showed only a slight increase over that associated with the gold. The principal production came from Lumpkin and White counties with minor amounts produced in Cherokee, Paulding, McDuffie, and other counties. About 30 placer mines and 6 lode mines were in production during the year. Some of these mines have been active for several years; others were of the nature of prospecting or development work. Preliminary figures indicate that the production for 1936 will be considerably less than that of 1935.

Granite: The total production of granite in 1935 decreased slightly from that of 1934 although the production of monumental granite from the Elberton district increased. The ten counties producing granite in 1935 were, in order of the value of their production: Elbert, DeKalb, Warren, Madison, Henry, Oglethorpe, Harris, Union, Murray, and Butts. The production from Elbert County is largely used for monumental purposes, whereas that from the other counties is largely used as concrete and road metal, curbing and flagging, rebuilding stone, railroad ballast, and other uses.

Iron Ore: Brown iron ore was mined in 1935 by two companies in Polk County. The total production, although small, showed a substantial increase over that of 1934.

Kyanite: Kyanite, an aluminum silicate used in the manufacture of refractories, was produced in Georgia for the first time in 1933. An investigation in 1934 by the U. S. Geological Survey, in cooperation with the Georgia Division of Geology, resulted in the discovery of a large U-shaped body of kyanite-mica schist in Habersham and Rabun counties, as reported in Bulletin 6 of the Georgia Geological Survey. The production of kyanite in 1935 came from two deposits in Habersham county, one a residual surface accumulation of crystals derived from the weathering of this schist and the other a placer deposit in the valley of a small stream. In 1936 production of kyanite and a by-product of ground mica came from the kyanite mica schist.

Lime and Limestone: The only plant reporting a production of lime in 1935 was in Bartow County. The production of limestone, which showed a very substantial gain in 1935, came from the following seven counties, named in order of the value of their production: Houston, Bleckley, Gilmer, Pickens, Bartow, Whitfield, and Polk.

The larger part of this production was used as a road material, but limestone, both crushed and ground, was used for many other purposes.

Manganese: The production of manganese and manganiferous iron ore all came from the Cartersville District of Bartow County. The 1935 production of high-grade manganese ore increased slightly over that of 1934, whereas that of manganiferous iron ore showed a considerable decrease.

Marble: The Georgia Marble Company, with quarries in Pickens and Cherokee counties, was the only producer of marble in 1934. The production included a small amount of serpentine or verde antique.

Mica, Chlorite and Sericite Schist: No production of scrap mica and only a small production of sheet mica was reported in 1935. Chlorite schist from Cherokee County and sericite schist from Pickens County were ground and used principally as a filler.

Ocher: Ocher, a hydrated iron oxide used in the manufacture of linoleum, oil cloth, and as a coloring for mortars, was produced by two companies in the Cartersville District of Bartow County. The production for 1935 showed a substantial increase over that for 1934.

Sand and Gravel: Sand and gravel are produced at a number of small pits widely scattered throughout Georgia.

Slate: Slate granules for use in the manufacture of artificial roofing were produced by one company in the northern part of Bartow County. There has been no production of roofing slate in Georgia for several years.

Talc: Three talc companies near Chatsworth in Murray County reported a production of ground talc and talc pencils used for marking iron and steel. The production for 1935 showed a large increase over that for 1933.

Tripoli: Tripoli, used for abrasive and filler purposes, was mined near the foot of Lookout Mountain in Chattooga County. A summary of the tripoli resources of Georgia is given in Information Circular No. 9 recently issued by the Georgia Division of Geology.

Water Power: The amount of electricity for public use generated by water power in Georgia in 1935 increased slightly over that reported for 1934. The value was figured at one cent per kilowatt-hour, the approximate value of the electricity at the source of production.

Preliminary figures received indicate that the mineral production in Georgia in 1936 will show a very substantial increase over the figures for 1935 given above. Far too much of Georgia's mineral wealth is being shipped out of the state in the crude form rather than being manufactured into finished products within the State.

It is interesting to note the changes in trend of the mineral production of Georgia through the years. When the Georgia

Geological Survey was first established some 45 years ago, nearly half of its mineral production came from metallic minerals such as iron ore, manganese, and gold. At the present time less than three per cent of Georgia's mineral production comes from these minerals and the bulk of its mineral wealth is produced from non-metallic minerals such as clays, granite, marble, and many others. The figures given above for the mineral production in 1935 show that 2.0 per cent of the production came from underground mining, 21.2 per cent was derived by quarrying (granite, marble, and slate), and 76.8 per cent came from open pit mining such as the clay pits.

Georgians are very apt to think that the mineral production of the State largely comes from the mountainous regions of North Georgia, but such is not the case. Dividing the State into North Georgia and South Georgia separated by the Fall Line that divides the Coastal Plain sediments from the Crystalline rocks, we find that in 1935 approximately 54 per cent of Georgia's mineral production came from South Georgia and only 46 per cent came from North Georgia.

WATER RESOURCES SURVEY STARTED

New industries for Georgia may result from investigation of the surface water resources of Georgia that will begin within the next two weeks, according to State Geologist, Richard W. Smith. The investigation, which will be jointly financed by the Division of Geology of the Georgia Department of Forestry and Geological Development and the Federal Government, will consist of daily, and in some cases hourly, measurements of the flow of the largest streams at some forty places in all parts of Georgia. Daily samples of water from ten of the most important streams will be collected and analyzed.

This work will be under the direction of the State Geologist and Francis M. Bell, district engineer for Georgia of the Water Resources Branch of the U. S. Geological Survey. Mr. Bell, a trained hydraulic engineer and a native of North Carolina, has been transferred from the St. Louis office to head the work in Georgia. The chemical analyses of the water samples will be under the direction of W. L. Lamar. The district engineer's office and chemical laboratory will be established in Atlanta to handle the work.

Mr. Smith states that the start of this work marks an important step in the industrial progress of Georgia. Definite facts as to the minimum and maximum flow of streams and the chemical quality of its water are an absolute necessity in locating the water supply of large industries, as well as for municipal water supplies, power development, flood control, design for highway bridges, and many other uses.







